

COOP'S TECHNOLOGY DIGEST

-A Timely Report On The *World* Of Communications-

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Russ Watson (Datek Systems) has spent the last two years of his life attempting to create a scenario that would bring TV3 to Queenstown. In his most recent effort, Watson offered to TV3 the opportunity to reach the bulk of the area's 5,635 people at no expense; Watson and others in Queenstown would pay for and install the equipment required to broadcast TV3 into the area; more than \$20,000 in 'donated' materials alone. TV3 turned Watson down, cold.

R.A. Papworth lives at Algies Bay, a small mostly vacation home community located east of Warkworth above Auckland on the North Island's east coast. Mr. Papworth, like most residents of Algies Bay, lives on the 'wrong side of the hill' for Auckland TV reception. His reception on VHF was filled with ghosts and noise; at UHF, SKY and TAB were mostly snow. He took his problem to an area TV dealer who conceived a low cost (under \$500) answer; on a nearby hilltop two TV antennas were placed back to back, with a typical home masthead amplifier between the two. The first antenna picked up the hilltop strong VHF and UHF Auckland signals, the amplifier beefed them up, and the second antenna retransmitted the flea powered signals down the hill to not only Mr. Papworth's home but to also approximately 25 other neighbours. Mr. Papworth celebrated by purchasing a subscription to SKY; a service he could not even detect without the relay device. But a neighbour who could not receive Mr. Papworth's relay complained to the Ministry of Commerce and the Ministry wrote Mr. Papworth a letter. Enclosed were several very complex application forms for a 'license application' for his 'TV transmitters'; and, a letter asking for \$3,500 in 'licensing fees.' Mr. Papworth turned off the relay and cancelled his SKY subscription.

Would-be cable television entrepreneur John Rutherford in planning a cable system for Greymouth sought ways of providing TV3 to the 2 channel community. Rutherford learned that TV3 could be received by a few fortunate homes located near the waterfront in Hokitika, some 37 kilometres to the south. Rutherford sparked interest in Hokitika having a TV3 relay and the town formed a committee and raised nearly \$30,000 in pledged cash to build the relay station. Steve Fogerty and Jim Jackson of Motueka firm JSF Electronics were contracted to build the facility. Rutherford offered to donate a five figure sum to the Hokitika TV3 fund raising if he could in turn be promised that the relay would squirt a small amount of TV3 signal up the coast towards Greymouth. He planned to receive and amplify the TV3 signal, and then place it on his Greymouth cable system. TV3 allegedly agreed to the Hokitika relay but only if Jackson and Fogerty agreed that everything possible would be done to insure that Rutherford could not pick up the signals in Greymouth. Accordingly, a 25 watt transmitter operating at 5 watts, and transmitting antennas which favoured every direction but Greymouth were installed. And the Hokitika

community group reportedly had to also agree not to accept funds from Rutherford's Greymouth cable firm as a further condition to receiving TV3 licensing for their channel 11 relay. TV3 representatives will not admit that any such conditions apply.

"State control of television is doomed to fail" was the newspaper headline following a speech delivered to the Asia-Pacific Broadcasting Union by TVNZ CEO **Brent Harman**. He went on to observe *"The window to the world via satellite television is now open, and I think it will be impossible to close. Information which in the past has been the prerogative of the political elites has become available to everybody with access to a television set and a satellite dish."*

9 November 1993

A Television Coverage Seminar assembled at the Wellington offices of New Zealand on Air. 14 people gathered at the invitation of NZOA head **Dr. Ruth Harley** to listen and debate seven written presentations zeroing in on the *'TV3 Coverage Problem.'* Three representatives from TV3, including then firm head **Ken Clark**, listened to the presentations and questioned each presenter concerning fine points of the individual proposals. New Zealand On Air is mandated by legislation to fund rural area TV (as well as AM and FM radio) transmitters annually. In 1992 NZOA spent \$3,330,000 to maintain TV1 and 2 translators at several hundred locations throughout New Zealand. In 1993 (year ending 30 June) this expenditure was reduced to \$638,000.

New Zealand On Air inherited the rural coverage responsibility from TVNZ. In the past from moneys collected for annual TV and radio licensing fees TVNZ's separately run technical arm, BCL, has conducted the maintenance required (\$4,451,020 in 1990 and 1991).

BCL (Broadcast Communications Limited) is an interesting, almost transparent, entity. TVNZ remains today a State Owned Enterprise (SOE). It is free to compete in the commercial arena with non SOE firms and does so daily. BCL was initially merely a separate desk at Broadcast New Zealand (BCNZ). Somebody had to be responsible for determining where new TV transmitters would be located and a field engineering group was assigned. This 'desk' drew up the first national TV1 coverage plan, arranged for the hill or mountain top sites, saw that sites were developed (roads built, power installed) and put the transmitters into service. Over time the BCL operation grew; first with the development of Pacific Television (TV2) and more recently as a TV frequency license holder in its own right (BCL owns 29 UHF TV frequencies, plus microwave frequencies, et al acquired in the course of the various 'frequency auctions' conducted in the past five years). BCL operations remain largely veiled behind TVNZ skirts, however, and having used public funds to acquire and develop hill and mountain top sites, it literally dominates the flow of new FM and television stations by standing between the private license holder and his going on the air. SKY Network CEO **John Fellet**, commenting recently on the rumoured sale of TVNZ properties (National Business Review: December 15, 1993) noted *"If I was given permission to purchase any portion of TVNZ I wished, I would choose BCL. By owning or controlling the transmission sites, BCL can make or break a new operation."* **John Howard** of the Paeroa-based Regional Television Trust might agree. Howard filed a complaint with the Commerce Commission alleging that BCL had 'breached restrictive trade practices restraints' found in the Commerce Act. Howard, in attempting to launch a new community access television service for Waikato, Bay of Plenty and the Coromandel Peninsula region believed BCL price quotes to him for a new TV transmitter were \$142,000 higher than prices he obtained overseas. He also alleged that BCL wanted \$300,000 more per year, for TV transmitter site rental, than 'overseas estimates for similar stations.' To Howard, BCL was practising 'predatory pricing' and the pricing structure made it difficult, if not

impossible, for his Trust to get the community access TV service on the air. Howard also claimed that when he tried to bypass BCL and provide his own transmission equipment to use on a BCL controlled transmission site, he was told the site was only available to him if he took the full transmitter/tower/antenna package from BCL. By controlling who does and does not operate from the developed sites, BCL controls the marketplace. BCL has consistently refused comment on the commission's investigation.

In the world of real estate development, there is a sage saying that describes how a particular piece of real estate is valued.

"There are three requirements for a good real estate investment: location, Location, and, LOCATION."

To that TV3 would add **"channel."**

In the Wellington NZOA Seminar, TVs **Gerry Smith**, Ken Clark and Phil Johnston (JDA Associates, TV3 engineering consultants) listened with special patience as the seven paper presenters proposed various schemes to create for TV3 'coverage parity' with TVs 1 and 2. According to NZOA records, TV1 reaches 99.3% of all New Zealand homes; TV2 98.7% and according to TV3 they reach 93%.

Reaching 'coverage parity' with TVNZ is the elusive goal of TV3. Up to their present level of coverage, TV3 has paid for all of the transmission facilities. But, they argue, they should not be required to pay for the remaining coverage because TVs 1 and 2 did not pay for their 'extended, rural coverage.' It is a murky area, indeed.

TV1 presently operates from 423 separate transmission sites to achieve 99.3% claimed coverage; TV2 only slightly fewer sites. TV3 on the other hand has 63 sites. TV3's primary missing' regions are South Coast's western slope and all of north island beyond the Whangarei-Horokaka coverage. By TV3 calculations, 245,000 New Zealanders presently are without their service. The actual number is likely to be as much as 50% greater than this since not all TV3 transmission sites (area by area) have parity with TVNZ and TV3 further suffers by its channel allocations; often forced to take the least desirable channel in a given region.

Channel 'number' is very important to TV3. In a list of criteria presented at the NZOA Seminar, TV3's Gerry Smith explained what they look for when approving a new transmitter site:

1) Channel. If TVs 1 and 2 are using low band in a given area (such as channels 1 and 3 at Hedgehope) and TV3 is forced to use high band (7 at Hedgehope) TV3 knows that antennas already installed for channels 1 and 3 will perform poorly, if at all, on channel 7. The reverse (TVNZ on high band, TV3 on low band) is an even less desirable 'fit.'

2) Location. If the TV3 transmitter, for whatever reason, is forced to locate on a hill/mountain top separate from TVNZ's 1 and 2, viewers will have their existing TV antennas pointed at TVNZ, not TV3.

In both situations, TV3 loses potential audience because they do not believe the average viewer will spend additional dollars for a special-TV3-aerial. Ken Clark told the group *"If we are carrying cricket or some other high viewer interest programming, people will put up with lower quality reception because of the programming. But if our picture, in comparison to TVs 1 and 2 looks worse, we miss out with casual (channel scan and stop programme selection) viewing."* Casual tune-in pays the bills, reflected by those audience measurement machines that record how often, and for how long, viewers 'drop in' on channel 3. The cumulative audience, over time, is what establishes audience averages and increased audience averages translate directly to higher advertising rates for TV3 commercials. Anything TV3 management does, in expanding service to new areas, that works against 'casual viewing,' is bad for business.

Location, and channel; the two most important criteria for TV3 service expansion.

Unfortunately for TV3, New Zealand has but 11 VHF channels. As Hugh Railton, Manager of Engineering Services for the Communications Division at the Ministry of Commerce told the NZOA Seminar:

"The 11 VHF channels available for TV1, TV2 and TV3 ... are insufficient in number if TV1, TV2 and TV3 all seek 100% population coverage as an objective." Railton went on to suggest that as an absolute minimum, New Zealand should have 12 available VHF channels to allow all three networks the mix and match necessary to criss-cross the country with each of the primary networks.

Self Help (TV3) Extensions

Neither Russ Watson nor R.A. Papworth sought TV3 or NZOA assistance to extend TV3 coverage. Watson, backing a Queenstown community project to make TV3 happen, had devoted hundreds of hours working out the engineering and funding required. He came to TV3 and NZOA only to solicit their approval. NZOA's came quickly; not TV3.

Papworth wanted only to clear up reception at his Algies Bay home; that many of his neighbours would also benefit from his micro-powered relay device was a happenstance, not a plan.

Watson, very mindful of the limitations of the available 11 VHF channels, had proposed a UHF channel for Queenstown. Queenstown's terrain is very difficult and it requires 7 separate transmission sites to reach 5,635 people. On a cost per viewer basis, Queenstown may be the most expensive TV coverage community in New Zealand. Those 7 sites use and reuse the 11 VHF channels such that for TV3 to 'slide in' with new transmitters at all 7 sites would require massive re-engineering of the existing TVNZ sites not only serving Queenstown, but in adjacent areas. Somebody has to pay for this re-engineering and the way TV3 sees it, NZOA should be that somebody. If this happened, estimates run to well over \$1,000,000 for the costs involved to rechannel, and often re-site the existing TV1 and TV2 transmitters to allow TV3 into the region on 'full parity VHF channels.'

Watson did not propose to solve this tangled problem. What he did propose was to place a receiving antenna atop Coronet Peak to receive TV3 from its somewhat distant channel 10 transmitter atop Mt. Cargill. Then, using solar panel electricity backed up by diesel generators, and placing the new TV3 equipment inside of a building that already exists for Amateur Radio VHF repeaters, he would rebroadcast TV3 down into the primary sections of Queenstown using a UHF channel.

TV3's Ken Clark said *"Absolutely not, not on UHF!"*

The position was amplified by Gerry Smith and JDA's Phil Johnston who cited and recited the policy at TV3:

First Criteria - The TV3 transmitter must be at a location where TV1 and 2 are located.

Second Criteria - Reception of the TV3 signal should be possible on existing TV1 and 2 antennas. Coronet Peak's TVNZ transmitters operate on VHF channels 4 and 6.

Hold on ... Queenstown has a UHF independent station already on channel 34. Does that not suggest people have already purchased a special antenna for UHF?

Not in TV3's mindset. Channel 34 is located on another Queenstown transmission site (Peninsula Hill) so the existing channel 34 antennas wouldn't help many people with TV3 on UHF from Coronet Peak. *"And,"* as Clarke later cautioned, *"channel 34 is a tourist oriented station. Not many people have invested money in an antenna for them outside of a few motels."*

Watson restated that this installation would be paid for by community funds; all they asked from TV3 was 'permission' to carry TV3 via their self-help relay station. *"Suppose this station was*

replaced in say two years, or even one year, by a 'proper' VHF station?" asked Johnston. "Would you still go ahead with your UHF station, and spend your \$20,000, if you knew that in two years or less it could be replaced with a VHF unit?" Watson said he would.

Segue now to the small west coast community of Hokitika, just across the Alps from Queenstown. There hopeful cable entrepreneur John Rutherford has fired up the community with a proposal they bring in TV3 with a self-help relay. Because of a quirk of nature and the laws of refracted radio waves, at a small spot near the wharf at the end of Beach Street TV3's channel 6 signal radiating from Sugarloaf near Christchurch is received with near-studio quality pictures and no fading. Rutherford has no interest, now, in building a cable system for Hokitika but further up the coast, at Greymouth, he has the basic elements of a cable system underway. No one in Greymouth can receive TV3 and for all practical purposes neither can anyone in Hokitika since few people live at the end of Beach Street where the signal lands on a patch of ground only slightly larger than a typical home lot. Rutherford then encourages an old hand at TV translators, Steve Fogarty assisted by Jim Jackson at JSF Electronics to engineer a system. Unlike Queenstown, Hokitika has an available VHF channel (11). And by another bit of good fortune, VHF channel 11 happens to be the channel reserved for future TV3 use in the area. Rutherford sees a 'marriage' here; if the community of Hokitika can be encouraged to raise some funds for the TV3 relay, Rutherford's PacSat Communications will donate \$8,000 to the pot. Rutherford calculates that if TV3 is relayed on channel 11 in Hokitika, 37 kilometres north in Greymouth he will be able to erect a sizeable antenna for channel 11 and pump it into his Greymouth cable system. If there is a single TV channel that might guarantee the success of a Greymouth cable system, it is TV3.

Hokitika electrician Simon Nikoloff encourages the formation of a TV3 Trust and every home in Hokitika plus those outside but within the anticipated range of the new relay are contacted. In two weeks 637 homes have pledged \$50 each; \$31,850, and shortly 421 of those who pledged have actually paid their TV3 fee (\$21,050 collected). The December 16th edition of The West Coast Times shows Fogarty and Jackson working from a boom truck bucket mounting the channel 11 transmitting aerials. *Hokitika receives TV3 as a Christmas present.*

But there were complications. To obtain permission to relay TV3, Hokitika had to first talk TV3 into taking out the license for the channel 11 transmitter. Under the Ministry of Commerce rules, VHF channel transmitting licenses can only be granted to TV1, TV2 or TV3; no privately owned VHF licenses are possible. MOC's Hugh Railton, speaking to the NZOA Seminar, explained why.

"The Ministerial Statement of Policy provides for the expansion of the existing TV1, TV2 and TV3 networks within the VHF bands. Over the next year ... the VHF TV bands will be brought under the provisions of Part II of the Radiocommunications Act of 1989. (With) the VHF TV bands being brought under management rights, a clear decision is needed as to who will be the licensee of these extra translators. To date all small 'self help' systems have been licensed in the name of the TV channel they are relaying."

Ministerial policy, founded in law, reserves all VHF channels to TVNZ and TV3. The exceptions, if there remain any, date back to the 1970s when private groups such as the Hokitika TV3 Trust often provided TV when (then) BCNZ was unable to do so.

The Hokitika group like Russ Watson in Queenstown had to secure the approval of TV3 to go on the air. Another Ministerial policy (not founded in law) says that relay stations need the permission of the network operator for purposes of *copyright* clearance. Whether this is legally correct or not, no 'apparatus' licenses are granted by Radio Operations unless TVNZ or TV3 file

the applications. Fogerty and Jackson, acting to install Hokitika's channel 11 TV3 relay, would be guilty of placing a transmitter on the air without a license had they attempted to complete the project without TV3 approval. Russ Watson would be in the same spot if he went ahead with his TV3 project in Queenstown. In New Zealand history people have been prosecuted for doing this sort of thing.

VHF Management Rights

The Radiocommunications Act of 1989 directed the Minister of Commerce to change the system for granting of VHF licenses. Today, each VHF TV transmitter is granted what is known as an 'Apparatus License,' a specific license for a transmitter at a specific location, owned and operated by a specified party and for a specified term.

Section 48(b) of the 1989 act describes a different scenario. UHF television licenses went out for tender (as announced in the New Zealand Gazette 14 December, 1989) as 7 lots of 29 license locations (each) plus 63 additional lots of a single license location each. As we reviewed in CTD for December 1993 (p.38) when all of the bidding was over and the bids evaluated SKY Network ended up with 174 license locations, BCL with 39, UCB with 39 and TAB with 36. Thirty other firms 'won' 54 additional channels.

Under the terms of Section 48(b) when you bid on and 'win' a TV channel location, it is yours for a term of 20 years. You may do with this channel virtually anything you wish, including transmitting something other than television programming if you so choose. You may also sell or trade (with conditions) your channel to another party.

Railton and a Ministry staff that is directed by Ian Hutchings (Manager, Radio Spectrum Operations) and advised by Wayne Wedderspoon (Manager, National Radio Spectrum Policy) have spent some 13 months now preparing for this VHF change. As Railton told the NZOA Seminar, *"The effect of this will be that all apparatus licenses become void and are replaced by licences created under Part VI of the Act."*

The target date for this project's completion is mid year; this year.

"There May Be Some Windfalls Here . . ."

In 1989 when Parliament adopted the present Radiocommunications Act, the phrase 'digital television' was seldom heard beyond a handful of overseas research laboratories. Parliament, as well as it might understand the technicalities, was laying the legislative framework to allow TVs 1, 2 and 3 (recall that TV3 was in 1989 barely launched; the official opening date being 06 November 1989) to change from short term renters of TV channels to longer term '20 year owners' of television channels. In 1989 a TV channel was defined (at VHF) as a 7 VHF wide bandwidth between two specified points (lower and upper frequency limits). Everyone knew, possibly even some Parliamentarians, that if you wished to transmit a television programme, you must have a TV 'channel'.

The Ministry moved to place for tender the (then) brand new UHF TV channels first; they, after all, would raise cash for government. The VHF channels, on the other hand, would when transferred raise no cash. Legislation mandated that channels in use by TVNZ (for TV1 and TV2) and in use by TV3 would merely be treated under the terms of Management Rights in much the same way as their UHF channel counterparts were to be treated.

The history of the VHF channelling shows the system growing over a chequered path. When TV first began in New Zealand (1959 for NZBC; slightly earlier for two pioneer stations in Auckland

and Christchurch who lost status when NZBC started up), as Ralph Jaeger (MOC Manager, Licensing and Enforcement) recalls:

"Television transmission using Band I (channels 1,2 and 3) was adopted by the New Zealand Broadcasting Service in 1960 as this band was being adopted by broadcasting organisations in neighbouring countries such as Australia and was in common use in other portions of the world, particularly in Europe which New Zealand looked to for technical guidance.

"Band I transmission was particularly suited for the establishment of new services in New Zealand's hilly terrain. It could propagate over long distances and the shading effects of hills was less pronounced than is the case with the higher frequencies. The use of Band I produced a very rapid increase in television receiver licence fees and television advertising revenue, in turn, provided finance for further coverage expansion."

Alas, the four initial TV transmitters spotted at Auckland, Wellington, Christchurch and Dunedin left major portions of the countryside unserved. Those channels we now call Band III (channels 4-10; 11 was added much later) were reserved for TV use but not actually put into use for a number of years. By alternating between channels 1, 2 and 3, and switching transmission polarisation between regions, the three Band I channels offered sufficient room for all major (and a few minor) market areas to have their first TV channel.

Not all New Zealanders were satisfied to wait for local TV to arrive and some began to experiment with placing receiving systems on hilltops and then connecting the often distant-originated signals to a low power (from under 1 watt to as much as 50 watt) transmitter. To do this effectively, unlike R.A. Papworth of Algies Beach, these relay stations converted the incoming channel to a new channel for rebroadcast. Jaeger again:

"These (translator) units could be made very cheaply by Kiwi do-it-yourselfers provided they received on Band I and retransmitted on Band III. They were initially licensed to transmit on channel 6 but they proliferated so rapidly and in so many areas that they began interfering with each other; additional Band III channels had to be used. At this stage the New Zealand Broadcasting Corporation began to develop a channelling plan for the whole country and made allowance for a future second nation-wide network in this plan. (At this time) most of the privately owned translators were taken over and upgraded by the Corporation."

The 'channelling plan' was quite far advanced by 1979; ten years before TV3 signed on the air. TV3's appearance was a major cause for the addition of channel 11 to the VHF channel plan and this channel plus 'natural holes' in the Band I and III allocations for channels 1-10 allowed most of the TV3 needs to be met. But not all, as Hugh Railton admits (*"We really need 12 channels to do this right."*)

It is no particular person's fault, no particular agency's fault that between the adoption of the 1989 Act and today the word 'channel' has come to mean an entirely different thing. The blame, if you can call it that, lies with the very rapid, and quite unexpected, progress made by a totally new TV transmission technique called 'compressed digital television' (CTD 9308: p.2).

The 1989 Act made the then correct assumption that a TV channel in bands I and III was 7 MHz wide. Even a first year engineering student in 1989 knew you must have 7 MHz of 'spectrum space'; to transmit a television signal. Unfortunately this is a true statement only if you rephrase it as follows:

"...you must have 7 MHz of 'spectrum space' to transmit an analogue television signal."
Yes, the added word is 'analogue'.

Analogue is of course the TV we have today; the same TV we began with in 1959. Digital TV, on the other hand, does not require 7 MHz of spectrum space. If we are defining a TV 'channel' by the amount of spectrum space it requires to transmit a TV programme, 7 MHz is far too much space for digital TV. In fact, with the November 1993 adopted 'World Standard' for digital TV (following something called the MPEG-2 format; MPEG-2 is pronounced 'M-peg two'), a 7 MHz space can accommodate no fewer than *four* TV programme 'programmes;' simultaneously.

As recently as one year ago perhaps 50% of the 'serious, qualified TV engineers' in the world would have suggested that MPEG-2 digital television would be ten to fifteen years in arriving. Hardly anyone with an engineering background questioned its superior performance and long list of advantages over today's analogue television. But history has taught us that previous 'major changes' in TV techniques have taken from 15 to 20 years to materialise from 'test tube' to the 'front living room.' Colour, for example, began in New Zealand just over twenty years ago; in the UK 25 years ago. VCRs for the home were first sampled in 1974 and here it is 20 years later as they pass the 75% point in home penetration. Why should digital happen any faster?

The precise time frame when digital TV will replace analogue TV is highly relevant, however, to the implementation of the 1989 'Act' culminating in the award of fully tradable twenty year rights to TVNZ and TV3.

If TVNZ and TV3 are to be granted 20 year licenses (in the case of TVNZ, to 843 TV 'channels' at 423 transmission sites; in the case of TV3 for at least their present 63 transmitters/sites), and these licenses specify 7 MHz wide 'channels,' is not the Ministry actually awarding to each existing network four or more digital 'programme channels' when in midyear it hands out the management rights?

It would seem that at least one qualified telecasting executive believes this to be true. Norman Geary, TVNZ Chairman, in his 30 June 1993 half-year report on the affairs of TVNZ, noted, *"The arrival of digital compression of transmission signals will increase the availability of channels by at least four and result in increased competitive pressures. We intend to expand the range of channels and services TVNZ offers to the public."*

Geary is hardly alone. Sky Network CEO John Fellet says, *"One of the primary reasons why we have not activated our fourth channel (SKY has a minimum of four in most market areas but today utilises only 3) is the 'promise' of digital. When the hardware becomes generally available to us at reasonable prices, we will look hard at taking the fourth (UHF) channel and digitally placing perhaps all of our then-existing programmes on that one channel. This will allow us to provide simultaneous (parallel) service via both digital and analogue while we convert all of our home decoders to the newer digital models. Once that is done, we could then conceivably go back and take the original three analogue channels off the air and place on each of these reclaimed channels four or more new programming services."*

TV3's Gerry Smith believes the 'impact of digital' will be felt in New Zealand before the year 2000. Many of TV3's agreements for BCL contract service, for example, run out around 2000 and Smith believes major changes will occur before that time.

Dr. Ruth Harley, heading up New Zealand on Air, has a practical concern about the arrival of digital. *"There are constant pressures on NZOA to fund ongoing transmission services; TV1 and TV2 at present, TV3 if we can work out the details. We are reluctant to agree to fund analogue TV transmission systems very far into the future. We don't want to be caught paying for technology that is outmoded and nobody wants after its time."*

There is an even more fundamental 'channel question' involved. When the Ministry of Commerce, acting on its mandate evolving from the Radiocommunications Act of 1989 finally does award 20 year management rights to TVNZ and TV3 in midyear, are they granting these two firms licenses to transmit one programme per channel, or, up to four programmes per channel? Is a channel today the same as a channel will be in 2014 when the new management rights run out?

Almost nobody believes this will be the case. But the Ministry staff lead by Wedderspoon and Hutchings seems uncharacteristically stubborn on this point. Hugh Railton, speaking off-the-cuff at the NZOA TV3 Seminar, voiced his personal opinion (one which Ian Hutchings on questioning promptly disclaimed was a policy of MOC):

"When the VHF Management Rights are granted, there may be some windfalls... ."

The Logic Behind Ignoring Digital

"Windfall: 2. a piece of unexpected good fortune, especially a legacy."

"There are no plans by the Ministry to reserve or convert any of the existing VHF or UHF television bands for digital television. However, should existing licence holders within these bands wish to initiate changes to their licences to accommodate some form of digital television transmissions, then the Ministry would consider facilitating this by whatever means appears most appropriate at the time." **Wayne Wedderspoon, Manager, National Spectrum Policy** (18 October 1993).

"The statements by Mr Geary should of course be referred to him for any further information but I can assure you that there is no study or knowledge by the Ministry of such a 'four channel' or digital conversion plan for TVNZ services. However, such a conversion may well be feasible at some date in the future. In a deregulated environment it would not be appropriate for the Ministry to plan and define technical configurations in the absence of clear mandates from Government. You clearly believe ... a significant investment ... is likely in digital television systems and that the Ministry should plan for such. I, frankly, am less than convinced that we are presently at such a threshold. The mere availability of technology is not sufficient reason for change." **Ian Hutchings, Manager Radio Spectrum Operations** (1 December 1993).

That television 'channels' are as important to telecasters as rolls of blank paper are to newspaper publishers is unquestioned. But, that a newspaper publisher ordering one roll of paper and paying for one roll of paper should receive four rolls of paper ... well, quite another matter.

The Radiocommunications Act of 1989 tells the Minister of Commerce he must, within the language of the Act, create VHF Management Rights for TVNZ and TV3. The Act was adopted when a channel was an 'analogue channel'. Now, some 4.5 years after the Act was created the technology has changed such that the one roll of paper promised to the VHF telecasters has become at least four rolls of paper. The net effect will be that TVNZ can grow from TV1 and TV2 into TVs 1,2,3,4,5,6,7 and 8 all with the two-(analogue)channels-per-transmitter-site which the Act mandates. Probably wishing he had never said it now, these are the Railton-described "windfalls" about to be bestowed onto our three national VHF network operators.

The Ministry of Commerce remains convinced it can ignore this dramatic change in television transmission technology. It admits that no Ministry studies have been performed, there are "no plans to convert any existing television bands for digital television." Is that wise?

The Ministry, as noted by Ralph Jaeger, draws from the examples set by (he said) "Australia" and "Europe." The Ministry also leans heavily upon New Zealand's membership in something called the International Telecommunication Union or ITU and their CCIR standards programme. The ITU resembles a United Nations for matters relating to telecommunications. When disputes arise between nations concerning the use of frequencies (and currently even satellite parking spots above the equator), the ITU attempts to sort them out. The ITU does not meet constantly, however; divided up into dozens of subgroups, each one with a special area of expertise, most such subgroups meet in person at a point such as Geneva (Switzerland) every second, third or fourth year. In between these 'sessions' the subgroups, relying extensively upon the exchange of data via written reports, work on 'assigned projects.' Digital television involves Radiocommunication Study Group 11. Under the wing of 'Group 11' are Task Groups and Working Parties; more than a dozen in all. Individual countries provide personnel who serve typically on a Task Group or Working Party. A master 'Coordination Group' oversees the progress (or lack thereof) for each Task and Working body. Ian Hutchings is a representative for New Zealand to the ITU body now trying to sort out world standards for digital television.

Hutchings has earned the right to represent New Zealand, to serve if asked in study, task or working bodies, by his own longevity within the New Zealand Ministry of Commerce. Many younger men at MOC perhaps aspire to the day when they might also represent our country at the ITU and undoubtedly admire Hutchings participation. Hutchings does not take this work assignment lightly; it is akin to earning one's doctorate in a field of complex technology.

Hutchings believes that when CCIR has sorted out their standards for digital television, then and only then can New Zealand begin to plan for digital TV here. A November 1993 publication of Radiocommunication Study Group 11 reported:

"...the chairman observed that we had now arrived at a new era in television broadcasting with many new developments being initiated by the work on HDTV and digital television. The digital television systems now under study offer the prospect of considerably improved quality with an appreciably improved spectrum utilisation as compared with current analogue signals. The development of these systems would be beneficial to the end-user only if carried out in an orderly context where appropriate standards can be set."

In the past new innovations in television (the advent of colour, the creation of satellite delivered television, the addition of stereo sound to television broadcasts et al) have been "orderly" and only after "appropriate standards have been set" (by the ITU). But times are changing and the infrequent meetings of Study Group 11 are threatening the role of ITU in setting such standards for digital television. The ITU thinks in terms of devoting 3 to 6 years 'studying' a proposed new standard before acting upon it. The speed by which the leading technological nations and the major consumer electronic manufacturers have proposed, designed, perfected and then approved a non-ITU digital television 'world standard' has rattled the ITU cage. In their November 1993 report they note:

"Taking into account the urgent need to maintain and accelerate the studies on digital coding of TV vision and sound, and with a view to maintain the leadership role of the CCIR, the Coordination Group agreed to set up an informal Ad-hoc group on digital coding ... to make proposals and coordinate activities in this field."

This was done by the CCIR/ITU in knee jerk reaction to the world trade press proclaiming from March-April of 1993 onwards that the MPEG-2 format was now the new 'world standard' for the evolutionary, new digital television. The CCIR, seeing its leadership position disappearing in a very important field, moved the advancement of the slow, tedious multi-year digital TV study out of the

area of working and task groups into a streamlined committee chaired by a Japanese electronics scientist. A world standard without CCIR/ITU 'approval' was unthinkable. And if the typically annual meetings were too slow to stay up with the Motion Picture Engineering Group (i.e., MPEG), well, perhaps 'Resolution 97' would help. Hastily adopted, it "*recognises the need for faster approval of recommendations in a rapidly changing telecommunication environment.*"

Ian Hutchings is comfortable working through the CCIR/ITU. He is apparently uncomfortable, along with many other CCIR participants, when a competing group, not previously in the business of setting 'world standards' rushes to the front and does just that. CCIR provides a convenient escape valve for Hutchings leadership in matters such as digital television. He can cite the lack of CCIR digital standards as a reason why he believes "*I am less convinced that we are presently at a (digital) threshold.*" The CCIR Study Group 11 November 1993 Chairman's Report ends with:

"The current time scale involves agreeing with the MPEG group, if possible this year (1993), (on) a baseband coding and multiplexing system which could find widespread use for terrestrial and satellite broadcasting."

Well, if you can't beat them, and if you can't slow it down, at least get your name attached to it so you receive some credit. And save some face in the process. Perhaps Hutchings belongs to the wrong group.

If the CCIR/ITU is not providing Mr. Hutchings and our Ministry of Commerce with guidance, what about Australia and Europe? Ralph Jaeger tells us that the system we have today was adopted because it was already in operation in Australia and Europe.

Australia's position in the conversion to digital is no more clear than New Zealand's. As an innovator in electronic technology, Australia has from the inception of television in 1956 been very inward looking. Their television channelling scheme, for example, is the only one in the world that starts down in the range where we have channel 1 (in Australia's case 45-52 MHz), and moves in jumps and starts first through low band, then through the FM broadcast band (they actually retain three TV channels in use that fall inside of our FM broadcast band), then they jump up to add a single, isolated channel (they call it 5A) between 137 and 144 MHz (which falls directly into a world-wide band set aside for weather satellites to send data back to earth). Australian TV receivers are channel-unique to Australia. More recently, they created a satellite TV delivery system that is just as unique; all in the name of protecting home industry (if you select channels nobody else in the world uses, you won't be flooded with foreign built products). If the Australian's have taken any notice of digital TV as a replacement for terrestrial analogue TV to date, it has received no attention in the Australian trade press.

And Europe? Well, Sweden has launched a national government funded programme to build upon the MPEG-2 'standard' for an entirely new interactive television/telephone/computer communications system. Their goal is that every home in the country, via either terrestrial transmitters, cable or satellite, will have two-way interactive access to every data base, every television programme available anyplace in the country. Yes, their government in co-operation with their broadcasters and their telephone company are paying the bills for this new system.

Mother England has spent 18 months conducting extensive tests of digital television. There are several digital TV transmitters and hundreds of test-site receivers functional as you read these words. England will announce a firm time schedule this year, perhaps very soon this year, under which digital television will begin. First it will parallel (simulcast) existing BBC/independent networks. Then new digital-only service channels will be opened up to allow brand new services to operate. They feel late 1995 or early 1996 is a likely time for digital simulcasts to begin. And by

2008 or before, all analogue transmitters will be turned off. The UK converted from 405 line to 625 line after a decade of similar simulcasting.

Japan has a time table for phasing out analogue; so too the United States. By years end, perhaps 50 countries will have such a schedule worked out. New Zealand is very unlikely to be on that list.

Ian Hutchings on responding to the new (digital) technology:

"New Zealand has, within its resources, been playing an active part in the promotion of new technologies and the adoption of a suitable National and international framework of regulation for their introduction. The recent holding of an ITU Enhanced Digital Television Seminar (October 1993) and workshop (promoted by BCL) and the role taken in (ITU/CCIR groups) are examples. It would be unrealistic to expect New Zealand could determine the appropriate technology for the world and it is recognised that world or at least regional standards are essential for effective market implementation of these services." (01 November 1993).

Satellites, TV Sets and VCRs

One of the primary reasons why the CCIR/ITU is so concerned about the speed with which the 'world' has accepted the not-invented-here MPEG-2 'standard' is satellites. Even before MPEG-2 had gone through its own formal (voted for) final approval process, MPEG-2 video was appearing on major satellite feeds all around the world. Advanced prototype MPEG encoders (at the satellite uplink transmitters) and MPEG decoders at hundreds of widely scattered receive terminals were processing television signals by this past September. Even our own TVNZ inaugurates use of a prototype MPEG(1+) format in February when they formally switch from analogue BBC satellite feeds to National Transmissions Labs (NTL/UK) digital video. Elsewhere, entire networks involving as many as 500 separate receive sites have already 'gone MPEG digital.'

One of the major benefits of MPEG (2) is that it eliminates for all time the incompatibilities of our three present major (plus many minor) analogue television formats. NTSC, SECAM and PAL analogue formats become transparent when there is a switch to digital. When everything is digital, video shot on a camcorder anyplace in the world will 'play through' on every (digital) television worldwide. The CCIR, by the way, estimates there to be 1,000,000,000 television sets now in the world. Which is of course one of the major stumbling blocks to the introduction of digital since none of these are digital TV sets.

Converting from analogue to digital (for all of the benefits that flow from that change) is easiest in the networking world. When video programming must be sent from point A to point B, as long as these two individual points have appropriate digital equipment, the transfer is possible. The problem becomes more complex when point A must serve points B,C,D, ... to Z. Now 26 sites require digital equipment.

The floodgates open this year as key custom encoding and decoding chips (which process raw video at the transmit site and reprocess the digital video at the receive site) begin to ship from firms such as C-Cube and Sony. The first mass produced digital receivers are now being produced by Thomson Electronics for the American DBS (satellite) system which 'turns on' in April. By April Thomson will have ramped to a start-up level of 100,000 complete digital satellite TV receiving systems per month.

CCIR/ITU study, work and task groups will continue to debate the 'digital format' decision for at least two additional years according to their own published time table. Hardly waiting for this group's after-the-fact decision, ten prominent consumer electronic manufacturers (eight Japanese,

two European) had already agreed how they will jointly co-operate using MPEG-2 in the design of consumer digital VCRs and home television receivers.

Which brings us to the root problem: ignoring the onrush of digital until it is too late.

Leading Japanese VCR/TV set makers believe the time table is as follows:

1996 - 10% of all VCRs and television sets produced will have digital format foundations.

1998 - 50% of all products will have a digital foundation, but they expect the percentage to be closer to 75% for TV receivers with screens larger than 22"/560mm.

2000 - 75% of all products will have a digital foundation including nearly 100% of all VCR/camcorder products.

At some point between 2000 and 2005 the set makers agree all mass production of analogue only TVs will cease. Of course there is nothing that demands an individual political entity (such as New Zealand) to switch from analogue to digital. But finding replacement parts for an antiquated system will grow progressively more difficult after 1998 and if 50% of all TV sets being manufactured are equipped for digital by 1998, consumers purchasing such receivers anywhere in the world will have spent money for a portion of their receivers (VCRs) which they cannot use in an analogue-only country. And once analogue-only TV sets are no longer built (between 2000 and 2005) consumers in an analogue area will be forced to make do with their existing receivers as there will be no analogue-only new product available for replacement. Restating Hutchings: *"It would be unrealistic to expect New Zealand could determine the appropriate technology for the world..."* Perhaps it is also unrealistic to stand aside as New Zealand so steadfastly ignores the changes in technology all around us.

The VHF Management Rights Mandate

Because the digital format differs so radically from the present analogue format, virtually every part of the technical 'standards foundation' in place for analogue must ultimately be reviewed. Channels, as we know them today, disappear. Coverage areas (how far a transmitter reaches) will be greatly improved; English and American tests over the past 18 months have proven to the sceptics that digital transmissions produce studio-quality pictures at distances as much as two-times as far as analogue transmissions presently produce snowy pictures. This could have a dramatic impact on the station to station spacing for any given channel since tests indicate a transmitter located at a site such as Waiaatarua (Auckland), for example, could perhaps provide studio quality pictures from KeriKeri to Hamilton and coast to coast. With digital, it is probable that of the 843 TVNZ present day transmitters, as many as 700 could be totally eliminated.

This is one of the concerns of Dr. Ruth Harley at NZOA; should NZOA be making even middle term commitments to fund the delivery of television into rural, 'non-commercial areas' for TV3 (along with TVs 1 and 2) when in fact TVNZ and TV3 could ... indeed should ... eliminate these translator stations with a switch to digital?

With digital, all of the 1950ish 'taboos' concerning television channelling are eliminated. For example, analogue format insists that you cannot use immediately adjacent TV channels in the same area (such as 2 and 3, or 5 and 6).

Hugh Railton while addressing the NZOA Seminar:

"The channelling for translators for pockets of coverage within the main coverage area has to be done so as to respect the primary station channelling. This is because the translators are sited where there is a good signal from the primary station and normally surrounded by homes also receiving the primary station. Adjacent channel transmissions therefore could give rise to interference to TV reception in surrounding homes. This generally means that the channel

adjacent to the channels used by (the) primary station cannot be used within the primary station coverage area."

Digital TV has none of these restraints. In fact, in tests conducted by the British in the London area it was even found that digital transmissions could share the same frequency spectrum as analogue with surprisingly good results. Nobody's suggesting that ... but it does demonstrate the robustness of digital transmissions.

VHF Management Rights, currently due for implementation by mid year, ignore both the technical changes in channelling and the certain elimination of hundreds of TVNZ/TV3 transmitter sites that will occur with digital. Moreover, by 'selling management rights' for a twenty year period (to run out in 2014+) for analogue 7 MHz bandwidths at specified present-day TV transmitter sites, the Ministry is casting in stone for the management rights period a national television system which is likely to haunt us long after Wedderspoon, Hutchings, Railton et al have retired from the Ministry.

Differences in opinion as to the changeover timing for digital are honest differences. History tells us that colour and VCRs (two recent examples affecting most home viewers) took ten or more years from introduction to have a major impact on the marketplace. But these changes were appendages tacked on in an evolutionary manner to an existing system; nobody 'had' to have colour, nobody 'had' to have a VCR. They were optional extras.

Digital is more revolutionary than evolutionary. And while the Americans and British and Swedish and Japanese (et al) will inaugurate within the coming two years separate digital transmissions to home viewers as a parallel to the existing analogue and then begin the gradual phasing out of analogue, New Zealand may not have that option. That is the 'root problem' facing not only the Ministry of Commerce but the entire television industry in New Zealand. *Can we ignore digital so totally* and move ahead with the granting of 20 year licence rights for TVNZ and its 843 analogue transmitters and TV3 and its 63 analogue transmitters?

The legacy of analogue could be a very costly one for New Zealand's television industry and more than 1.1 million TV viewing homes. At this 11th hour in the implementation of the VHF Management Rights Scheme, that is the question to be asked.

Meanwhile - Back In Queenstown

The Coronet Peak transmission site for TVs 1 and 2 service into the Queenstown region failed at approximately 9PM on Saturday January 8th. For whatever reason, BCL was unable to restart the off the air TV transmitters until late in the afternoon on Monday, the 10th of January. In this signal outage period Russ Watson's proposed stand-alone, solar powered UHF transmitter by which he proposes to expand TV3 coverage into Queenstown loomed ever more important.

TV3's reluctance to approve Watson's self-help proposal, thereby denying Queenstown access to TV3 under any circumstances, is founded in a complicated channelling problem unique to the resort community area. Here more than any place in New Zealand Hugh Railton's concern that 11 are not sufficient channels for 3 national networks jumps out to bite us.

TV1 expanded and pioneered the transmitter sites which are now shared with TV2. Where possible, 'public property' (hill or mountain top sites) were chosen. But roadworks and power into these remote sites cost big dollars; even when government itself owned the roading works and power company. TV1's expansion has been blamed as a major cause of government red ink during the 70s. TV2 piggy backed onto the existing TV1 sites at modest additional expense. TV3

presented BCL with the opportunity to 'turn a profit' and the more recent UHF stations and new FM stations increase BCL's profit pool. This is the reason SKY's John Fellet believes BCL is the one part of TVNZ he would buy if given that opportunity.

Until NZOA was created (1989) BCL maintained TV1 and 2 sites almost as an interoffice transaction. BCL, owned by TVNZ, simply did the work and billed the parent corporation. When NZOA became the dispenser of the public's annual Broadcast Licence Fee moneys, BCL continued its pattern of preparing an annual statement for 'services rendered.' Only NZOA was not as related as TVNZ, and questions were asked. Questions such as:

"Of the 843 transmitters which you maintain, which ones are you billing us for maintenance?"

And,

"How is it determined which translator sites are deemed 'non-commercial'?"

The last question is a killer. TV3 says that as of this past December, they are finished spending their own money to reach unserved New Zealanders. That 7% they claim not to reach are so scattered, they say, that the cost of reaching the remaining homes is far greater than the 'commercial value' of those homes. TV3 learned this 'trick' from TVNZ because TVNZ has been collecting money out of annual licence fees for years based upon their assertion that some of the homes cost more to serve than they contribute in economic value. BCL collected \$3,330,000 for serving these 'non-commercial' homes in 1991-1992. NZOA, after asking questions such as the two listed above, 'adjusted' BCL's 1992-1993 bill downwards and agreed to pay them \$638,000; 19% of the prior year's bill. It is unlikely BCL liked that adjustment.

NZOA has more responsibilities than space here allows study. In this one area, funding the extension of TV to 'non-commercial areas', TV3 enters the game. They claim they should receive a 'share' of the annual licence fees. To answer the question *"How do you determine which translator sites are non-commercial?"* TV3 responds *"All of those people whom we do not presently serve."* If they have 63 transmitters and TV1 has 423, this suggests 360 additional transmitters for TV3 are required.

In actual fact, TV3 has proposed approximately 150 new transmitter sites, to be funded totally by NZOA. The original estimated price tag was around \$16,000,000 but a later revision dropped it nearer to \$12,000,000. But in the interest of 'drawing a line,' TV3 and NZOA have agreed that any (TVNZ) transmitter site serving fewer than 250 people is not only 'non-commercial', it is also foolish given today's economics. Therefore if TV3 got from NZOA everything it wanted (at a cost to NZOA of \$12,000,000), TV3 would have 63 plus 150 or 213 sites; plus or minus a few. The final 210 (to 423) or so would be TVNZ's alone as each one serves fewer than 250 people.

To determine whether a site is commercially viable is quite complicated. It is more than merely the number of people served divided into the cost of the equipment plus the cost of maintenance. In some situations the cost of getting the signal to the transmitting site is far larger than the site and site equipment. Hikurangi and Maungataniwha in the Far North are examples of this since TV3 would presently have to be microwaved north from Horokaka into the Far North. Microwave means leasing sites and equipment from BCL and the rates are ... well, high. And the Queenstown dilemma is that to create sufficient VHF channels for TV3 to have a VHF channel of its own, a number of very expensive modifications must be made to transmitter channelling in adjacent areas. This means TV1 and TV2 throughout south central South Island would be moved channel by channel until new VHF channels were freed up for the Queenstown service. There could be more than \$2,000,000 in cost just for this exercise and all of it so that 5,635 new people in and around Queenstown can have TV3 on a VHF channel approved by TV3 from a transmitter location approved by TV3.

You can, perhaps, understand NZOA's reluctance to hand over funds to do this when people like Russ Watson are standing there transmitter in hand anxious to put TV3 into Queenstown in 30 days time. You can also understand NZOA's possible frustration that TV3 is so dogmatic about having 'channel and location parity' with TV1 and TV2 that they refuse to grant Watson permission to do 'his thing.' There are two more good reasons why NZOA can be pardoned for not rushing out to write a cheque for TV3's expansion into Queenstown:

1) Once Queenstown is installed and operating, the tremendous going in costs will guarantee that the community will forever remain 'non-commercial' in importance. In other words, TV3 will gain precious little (if indeed anything) from the commercial value of having Queenstown viewers. This makes their "NO Mr. Watson!" position even less defensible since it would seem a 'non-commercial UHF area' is worth no more nor no less than a non-commercial VHF area.

2) The Hokitika experience. Recall that TV3 insists that before they will approve a translator to carry their signal (and apply for the licence for same since that is the present rule), they must be satisfied that the new channel will have 'location and channel parity' with TV1 and TV2. In other words, they want to know that people will be able to 'casually tune in TV3' without the expense of a new aerial.

Hokitika TV3 is now on VHF channel 11. TV1 and 2 come into Hokitika from the Greymouth direction on channels 3 and 5. It might surprise TV3 that virtually all of the 421 Hokitika homes that paid their voluntary \$50 fee to the TV3 Trust also opted to purchase at a cost of \$90 a special channel 11 receiving aerial from local supplier Electrotech. For while the TV3 channel 11 signal is not at UHF, it is also not in the same direction as most Hokitika homes have their TVs 1 and 2 antennas pointed. And perhaps because TV3 insisted the channel 11 transmitter operate at the reduced (5 watt) power with transmitting antennas aimed away from Greymouth, Hokitika home owners were obliged to spend an extra \$90 for a channel 11 aerial. That most of them did so willingly would seem to be contrary to TV3's insistence that all of their relays have channel and location parity with TVs 1 and 2. TV3's fear that viewers will not spend extra money for a TV3 antenna certainly has not been validated in Hokitika.

Who Loses Here?

By TV3's admission, there are 245,000 Kiwis who are without TV3 service. All of these people reside in areas which TV3 claims they cannot serve on a commercial basis. To reach any new homes TV3 is asking NZOA for assistance.

It is highly unlikely TV3 will receive an amount of money from NZOA even approaching the \$12,000,000 it says it needs to have 'channel and location parity' with TVNZ. There are funds available at NZOA for this project but they are unlikely to exceed 10% of the amount TV3 is requesting.

If TV3's Gerry Smith is correct, within five years it won't matter anyhow. If, as he believes, digital will be upon us by that time, any money spent now to extend TV3 to the last 7% of the population is likely to be replaced by massive new funding (which TV3 itself will have to put up) for the conversion to a digital based transmission system.

Russ Watson's plan for Queenstown would provide TV3 service to at least some of the Queenstown region at no cost to TV3; almost instantly. And as Queenstown will always be a 'non-commercial' area for TV3, it shouldn't matter to them what channel it is done on.

Watson-like plans have been proposed to TV3 for Far Northern Communities, including Kaitaia and KeriKeri. They too involve use of UHF channels and they too have been discredited for that reason. One plan suggests that TV3 be relayed during its full broadcast day, and the (UHF)

channel be used by the local community through a Trust arrangement for the balance of the television day. In this way the communities involved hoped to build their own local community service, even if it must by TV3's schedule be in the middle of the night (fortunately there are VCRs to do time shifting!). TV3 liked this proposal even less, fearful that in the process of

WHAT MIGHT BE DONE? - An Editorial Opinion

The preceding report barely dents the surface of an issue that also involves funding for Maori and Iwi Television, the likelihood that as we approach 1996 several dozen direct-to-the-home satellite TV entertainment services will cover New Zealand, and, the unsettling complications thrown into the possible development of cable or fibre optic television by the antiquated 1962 New Zealand Copyright Law.

We do believe this report raises a number of important issues that beg attention before the VHF Management Rights scheme is finally implemented. They include:

- 1) The Ministry of Commerce should 'come clean' on the digital versus analogue channelling issue. If MOC intends to provide a 'windfall' to TVNZ and TV3, by granting them 20 year licences for 7 MHz wide analogue TV channels such that TVNZ and TV3 may then convert these 7 MHz channels into 4 or more simultaneous digital programming channels; *let them publicly say so.*
- 2) A review of the Radiocommunications Act of 1989 should be undertaken to determine whether it was the *intent* of Parliament to grant TVNZ and TV3 'spectrum space' for one TV programme channel (i.e., the analogue system), or, 4-plus TV programming channels. If Parliament *thought* they were creating a system such that TV1 would have a national *one* programme network, TV2 a national *one* programme network, and TV3 a national *one* programme network, and in fact the implementation of the VHF Management Rights will award each spectrum space for 4 or more national TV programme networks, Parliament needs to revisit this issue; before the VHF Management Right licences are granted.
- 3) TV3 has identified more than 150 new, additional (virtually all VHF) TV channels which it would activate *if it can* talk NZOA into putting up the expansion money. If by the date of VHF Management Rights licensing TV3 has not either activated or signed contracts to activate within 18 months any of these 150 channels, they should *lose any legal rights* they have to these channels. The channels should not be held in perpetuity for TV3 future use. These channels represent a 'spectrum asset' and, like the forests and the seas surrounding New Zealand, are public property. If TV3 will not use them within a reasonable period of time, these channels should be placed up for tender to other interested parties.
- 4) The Minister of Commerce should order an *immediate study* into the way the rules now demand huge 'low value' licence fees for reuse of spectrum space by rural New Zealanders who would like to relay TV programmes to their homes using micro-power boosters similar to that Mr. R.A. Papworth of Algies Beach attempted to licence. These systems merely extend existing services on their original channels over distances of a kilometre or less but present rules make impossible their implementation. *A change in rules is suggested.*

reaching new people in communities such as Kaitaia, they might also be helping create possible future competitors. That TV3 itself would spend no money for this new Kaitaia coverage seemed unimportant to their concerns.

And there is R.A. Papworth and the hundreds like him who are willing and able to spend perhaps \$500 to install a micro-power TV relay device consisting of two TV antennas and a TV signal booster. He wonders what sort of bureaucracy has been created that asks him to send them a cheque for \$3,500 to cover his 'low value licence' (Ministry of Commerce term for uncontested licenses in rural areas).

Papworth, Watson and more than 245,000 people like them are the victims of a system that began with great promise and noble aspirations. Somewhere along the path the original purposes were lost, and the rural and small town residents who most need assistance to receive metropolitan-grade television are now road blocked at every turn from even helping themselves at their own expense to improved television. It is a frustrating experience and it does not endear to them either the bureaucrats who created and run the system nor the Auckland based telecaster who denies them service in hostage for a shot at multi-million dollar grants from NZOA.

The losers, simply enough, are the very people who most need and most desire the services and who are even willing to pay the cost of these services.

In Their Image

The Ministry of Commerce, like the broadcasting entities it oversees, was created in an era when life was simpler, and slower. Quiet, unassuming bureaucrats formulated a system of rules, procedures and 'standards' with which they were comfortable. All of those who dealt with these people were forced to adopt or adapt to these procedures.

The CCIR standards of the IBU has provided a convenient substitute for original activity at the Ministry. Who can argue that a country setting out to formulate its own standards would run the risk of slow death by electronic-uniqueness? One has only to study the Australian system to see the downside of such uniqueness. It is safer to be a team player and follow the captain. Until another team comes along and takes the lead.

In a much speeded up world, Japanese VCR makers, European TV set designers will no longer tolerate a world standards organisation that launched its study of HDTV in 1972 and has yet to adopt 'standards.'

The Motion Picture Engineering Group (MPEG), always active in developing technologies, decided 21 years was too long to study high definition television and still lack a format decision. They took the lead and within two years MPEG-2 for high definition, compressed digital video was the result. A grateful satellite, terrestrial broadcast and consumer products industry quickly applauded the effort and stood in line to approve it.

None of this would be that concerning were it not for the unfortunate coincidence that finds New Zealand in the final stages of granting twenty year VHF Management Rights licences for our VHF television channels. This procedure, set in motion when the Radiocommunications Act of 1989 was adopted, has according to Ian Hutchings created between 400 and 500 pages of 'internal paperwork' at the Ministry. The bureaucracy is doing the job it has been told to do and no matter that in the 4-plus years of their trek all of the rules have changed. They intend to complete their assignment as mandated in 1989; unless, as Hutchings pens, "(there are new) *clear mandates from Government.*"

TECHNOLOGY

BYTES

...BITS AND BYTES YOU MAY HAVE MISSED IN THE RUSH TO MAKE A BUCK...

SATELLITE TV

PanAmSat (PAS-2) C + Ku band satellite scheduled for May launch and July activation from 169 east channelling numbers now available. On C band satellite has 12 transponders 54 MHz wide, 4 with potential width of 64 MHz. There are two separate downlink antenna patterns: Oceana/Global (which places 28 to 29 dBw level signal over New Zealand, 4.7 to 6.1 metre dishes); Pacific Rim (which places 30 dBw signal over New Zealand, 3.7 to 4.6 metre dishes). Satellite, unlike Intelsat series, uses linear vertical or linear horizontal polarisation (as is common in North America) which allows frequency reuse of same basic transponders twice; simultaneous use for vertical and horizontal transmissions. Horizontal and vertical channels are centred on 3730, 3790, 3850, 3915, 3980, 4040, 4100 and 4165 MHz. On Pacific Rim antenna pattern, any of 16 (8 vertical, 8 horizontal) downlinks may be turned on. On Oceana beam pattern channel centres are 3915, 4040 and 4165 vertical only with 3915 and 4165 capable of being 64 MHz wide. A 54 MHz bandwidth transponder is capable of simultaneously transmitting up to 6 studio grade compressed digital sporting events; a 64 MHz channel up to 8. In cable-format programming, a 54 MHz channel could carry at least 12 separate programme services simultaneously. On Ku band, PAS-2 also utilises linear vertical and horizontal polarisation. Of the 16 possible Ku transponders, four are dedicated to the Australia/New Zealand beam and all are 54 MHz wide and should arrive here with footprints of 44 dBw (1.2 to 1.6 metre antennas). All four are vertically polarised with transponder centres at 12281, 12401, 12531 and 12561 MHz. Three additional horizontally polarised transponders are switchable between Australia/New Zealand and China with centres at 12466, 12591 and 12716 MHz with the first and last capable of being 64 MHz wide. Numbers interpretation: A user intent upon delivering up to 12 cable-level programming sources into Australia/New Zealand could do so on any of the C or Ku band transponders just listed with compressed digital video technology. Or, using analogue technology, two video programmes could be simultaneously transmitted within the same transponder but with a backoff in signal level which would require larger (more sensitive) receiving system antennas. To date PanAmSat has not released any of its transponder users. Don't worry too much about the confusing numbers; at the appropriate time **CTD** will publish a simple to follow chart encompassing all of this data.

Intelsat 701, at 174 east, conducted system tests from mid-December onward, scheduled to go into regular service 15 January. CNN and other video signals have been observed there in New Zealand during testing phase. Satellite has 3 separate beam configurations at C and Ku: hemi (full globe as seen from satellite), zone (typically New Zealand and Australia but also includes SE Asia as well in separate zone) and spot (Australia's east/southeast only). Intelsat advises in best receive situation (Ku band spot beam) antennas down to 1.2m in size will provide noise free video service. New Zealand, out of spot beam coverage, would require antennas greater than 1.2m in size on Ku, no less than 3m in size on C. Intelsat 701 will move, according to present schedule, to replace ageing 508 at 180 degrees in April 1996 and at that time will carry "some or all of the traffic currently at 180 for continuity." Schedule for second Pacific Ocean Region 700 series satellite, to be known as 703, has changed again. As of January 10th advisory to **CTD**, 703 will be launched July 1994 to replace 511 at 177 east and should be in operation from 177 east by this October.

Successful launch (17 December) of Hughes built DBS-1 satellite from French Guiana launch site moves North American introduction of 150 channel digital video service step closer. DBS (direct broadcast satellite) service, using trade name of DirecTv, will feature NZ\$1200 home receiving system with 460cm dish manufactured by Thomson under RCA brand name. First programming is scheduled in April through DBS-1 with 16 transponders, each 120 watts power, on board. With MPEG based compression package, as many as 75 TV programmes can be simultaneously provided. A second satellite, DBS-2, is planned for launch in August adding an additional 75 TV programmes to viewer receivers. Thomson Consumer Electronics has acknowledged some problems relating to establishing uplink (to satellite) encoders that will compress multiple TV programmes into a single analogue-bandwidth transponder but insists subcontractor Compression Labs Inc. will be ready for programme tests.

DBS spokesman said "*CLI may have underestimated the complexity*" (of the encoding system hardware) "*but they will meet the deadlines.*" CLI has sold 5.6% of its common stock shares to Fletcher Capital Markets for US\$9.9M and tripled the staff working on completing the uplink encoding packages. Thomson receiver uses 4 custom ICs which perform digital decompression and D to A conversion along with individual receiver addressing for customer identification and 'turn on'. First transmissions will be in MPEG-1 but by end of this year will switch to full MPEG-2 as uplink encoding system is updated. Switch will be 'transparent' to viewers since receivers are 'backwards compatible' to MPEG-1. In marketing arena, programming packages will vary upward from NZ\$14.50 per month for entry level 6 channel package. Thomson is shipping stand-alone point of sale dealer kiosks to 2,000 retailers. Dealers will have opportunity to sell complete systems (NZ\$1200 out the door), installed systems (add NZ\$270 for installation), various term warranties and they will also act as sales agent for various programmer packages with commission for each such sale. Self-install kit is also being offered (NZ\$125). DBS systems will be offered for cash sale, or, through financing plan which has been designed to cost home users 'equivalent to existing cable charges' for both software and hardware. Thomson is building complete systems at Juarez, Mexico plant and will ramp to 100,000 per month level by September.

Costs for satellite linking within New Zealand? Can you envision a business plan that would involve linking from one major centre (call it Auckland) to any number of separate points around New Zealand, via satellite? Now plug in a bandwidth of 75 kHz (such as a standard FM broadcast station) and ask the three possible satellite service suppliers (Optus from Australia, PanAmSat from USA and Intelsat from all over the world) to 'bid' on providing a 24 hour per day satellite 'link' for you. Tell them you wish to install receive terminals no larger than 2 metres in size and you wish sufficient 'rain fade' protection that your circuit reliability will be 99.9% or better. At this point each satellite operator surveys the available transponders on available satellites and comes back to you with a 'link budget' (calculation of projected receive site signal levels) and a 'dollar budget' (projected costs for full-time use). The costs? Not to exceed NZ\$110,000 per year, lower if you are willing to sign up for more than ten years and accept certain responsibilities for the uplinking. Now ... take your list of planned 'receive sites' (locations to which you wish to transmit 'data') to Telecom and ask them to quote you on providing a 24 hour terrestrial circuit, capable of at least 10 kilohertz bandwidth audio, from a central point (call it Auckland, again) to each of those sites. Their response will be approaching NZ\$1,000,000 per year. No typos here. Bottom line? Yes, satellite is less money than Telecom. And the more sites you have to reach, the cheaper it gets.

Satellite Cinemas is new attempt to extend recent release movies to small, rural theatres in lightly populated areas in Australia. The Sydney based firm is using Optus satellite space to test market concept of small, totally automated theatres typically seating fewer than 100 people. Firm believes any community 'market area' of 15,000 or more could support such a service and by delivering the movie via satellite the operator eliminates expensive theatre by theatre bicycling of movies, projection equipment, and most of staff overhead. The new theatres, typified by the 66 seater at Forbes (New South Wales), are big screen Dolby sound equipped with air conditioning. Entrepreneur Terry Olsen sees the system growing (he has some 70 sites identified as potential Satellite Cinemas) to include live sporting events and stage shows; anything that can be captured on film or tape or by a television camera can be shipped into rural Australia via satellite to his air conditioned theatres. Distributing first run movies to theatres using television as a delivery medium is hardly new; extensive tests financed by Paramount in the 1940s in Los Angeles proved the

SYNOPSIS OF CURRENT PACIFIC OCEAN REGION TV SATELLITES:

177W/Intelsat 503: Ageing, in inclined orbit with maximum north-south deviation of 3.8 degrees; no regular video. Scheduled replacement is 510 from 174 east within next 90 days. Primary use is on Ku spot beam relaying news from North America to Japan (not visible in South Pacific). Might have increased C band activity after replacement.

180/Intelsat 508: Ageing, in inclined orbit with maximum north-south deviation of 2.0 degrees (increasing to 2.31 degrees by year end). Scheduled replacement with 701 (now 174 east) April 1996. Primary carrier of US, Japanese, European, Australian news and programme feeds with acceptable reception down to 3m dishes (smaller with special electronics). ESPN (scrambled), CNN, US ABC/CBS/NBC, RFO, Worldnet, BBC et al here.

177E/Intelsat 511: Ageing, going into inclined orbit (maximum deviation 0.85 degrees) this year. AFRTS (scrambled), occasional Japanese feeds here. Scheduled for replacement with 703 (C + Ku) October 1994 start date.

174E/Intelsat 701: New this month, described as 'Primary Telephony' satellite but video was seen during testing. Has C + Ku capability, could serve dishes down to 1.2m (Ku Australia), 3m (C New Zealand).

169E/PanAmSat PAS-2: Scheduled launch May, operational July. 24 C and Ku transponders, capable of serving dishes down to 1.2m (Ku New Zealand), 3.7m (C New Zealand) or in Australia 0.9m Ku and 2.4m C.

concept but heightened the movie owners' fears that once such movies were placed into the airwaves, people could 'steal' the product. Modern encryption schemes, while not unbreakable, have considerably reduced that likelihood.

NBC (National Broadcasting Company) expansion into European TV service using recently acquired interest in Super Channel (delivered via satellite to an estimated 54M homes) will probably be followed by NBC acquiring similar distribution rights in Pacific/Asian region. NBC's new Super Channel Europe, which also reaches deeply into Commonwealth of Independent States, recently signed contract with British ITN to take 90 minutes per day from ITN for redistribution on satellite service channel.

Hong Kong's APT Satellite Corporation is on schedule to launch in June new Apstar I C band satellite to 131 east. Apstar II will follow closely with 26 C band, 8 Ku band (of which 2 are 'high power') transponders as early as this December. Apstar 2 plans to be at 134 east, spot now occupied by Tonga registered US based Rimsat and has announced 16 of its C band transponders have been pre-leased to HBO, Time Warner, Turner, Viacom, Discovery, ESPN and Hong Kong based TVB. No APT-2 revised coverage maps are yet available but their promotional literature does mention coverage reaching into at least portions of Australia.

Hindu group calling itself National Aryan Youth Council has marched on Parliament in New Delhi protesting what they termed 'invasion of Hindu culture by foreign films and television programmes.' Group claimed Calcutta youth who murdered three members of his family obtained idea from American TV movie he had watched days before on satellite service. Group also issued public statement that asked in part "*If the small city-state of Singapore can ban satellite and cable TV, why can't the mighty sovereign government of India stop this onslaught of our culture by foreign voices?*"

Asia Today Ltd., a Hindi-language satellite TV service claiming to reach 7,000,000 Indian TV households, has sold off 49.9% of its business to Hong Kong based Star TV. Buyer is controlled by Rupert Murdoch interests and recently has been quoted as citing plans to increase programming and competitive position into Indian sub-continent. With closure of Chinese market to direct satellite TV (**CTD**: 9312, p.20) Indian market has new importance to Murdoch.

Lebanon has reached internal agreement covering which telecasting service will represent country on middle eastern Arabsat satellite. Prime Minister Rafik-al-Hariri who owns something called Future-TV has represented Lebanon voice on Arabsat to date. Under new agreement, state operate Tele-Liban will represent country. Future-TV editorial positions had been confused as national policy by some viewers outside of Lebanon watching via Arabsat.

Optus, Australian satellite operator, has raised NZ\$1,440M in financing through consortium of six Australian banks.

Home Shopping Network, 24 hour North American consumer products channel, is going international with new Partner TCI; the same TCI that is merging with Bell Atlantic. That's the same Bell Atlantic that owns sizeable percentage of New Zealand Telecom and New Zealand Sky. Sky is the same Sky that is shopping around for new programming to fill its recently acquired TAB satellite channel. (Corporate inter-linking roadmaps are available from the popcorn stand in the foyer.)

Selwyn Cathcart (Telsat Communications Ltd; FAX 06-355-2141) points out his firm handles a multi-Ku-band range LNB (low noise block downconverter) capable of receiving the full Intelsat/PanAmsat/Optus wide range of Ku frequencies. Model 11-5600-1 (Wide Band LNB) from Chaparral Communications is the unit. One problem; it does require a more expensive receiver created to mate with an LNB i.f. from 950-2000 MHz.

DIGITAL TV

Television New Zealand's contract covering installation of National Transmission Labs (NTL) proprietary digital format equipment for London-Auckland link via Intelsat at 180 degrees has raised eyebrows of other digital designers. NTL system, described by TVNZ as using 'MPEG-1-plus format,' is believed to be such a temporary digital 'platform' that TVNZ could well end up with unique, one-of-a-kind hardware/link in year's time. NTL competitive digital link providers also point out the 'hand wired, customised nature' of the NTL equipment package makes it incompatible with fast developing MPEG-2 digital testing protocols. NTL says the contract period is for five years (through early 1999) covering simultaneous transmission of a pair of 8 Mbps compressed digital video service channels 'full-time,' plus the system allows expansion to a total of four CDV studio quality programmes simultaneously transmitted. TVNZ has been quiet about cost of hardware or decision to rush into digital a few months prior to the universal, lower-cost availability of MPEG-2 but NTL reported cost of contract at nearly NZ\$3M for NTL hardware alone. In letter to **CTD** this past October TVNZ engineering exec noted "*It would be unwise to*

take up a technology prematurely simply because it happens to be available," although that appears to be exactly what has happened here. For several years TVNZ had been quietly concerned by perception that non-TVNZ users have or could be made of BBC feeds and has threatened to 'scramble feeds' to protect their 'contract rights' for BBC material. Whom they accuse of 'pirating' their contract material has never been clear. Digital BBC feeds are scheduled to begin in February. BBC Television Centre in West London says their programming contract (separate from NTL hardware contract) authorises TVNZ to "receive and decode (BBC) at TVNZ studios in Auckland or at other locations in the Pacific or Asia as required." TVNZ is involved in day to day programming of Asian business channel now being distributed via satellite in Asia and has contract to put new Fijian television service on the air as well. Both would appear to be candidates for at least some of the BBC1 and 2 programming which the link will provide. TVNZ continues to deny any 'expanded use of BBC programming' is scheduled for New Zealand.

PERSPECTIVE: TV Receiver 'Transition' To Digital

There are two schools of thought concerning the transition from present analogue TV transmission to digital. School number one suggests "It won't happen soon, there's plenty of time to worry about it ... later." School number two says "Here is the suggested time table for the start of digital ... it begins tomorrow. Can I have your feedback by 5PM ... today?"

Cable TV hardware giant General Instruments believes digital transmission is already here and is pouring tens of millions of dollars into a home TV receiver they call 'Joey'. It is named after the Australian Kangaroo because GI sees the next generation TV as a 'pouch device'; a basic video display and sound system fed totally by unrelated boxes that nest or rest in a receiver 'pouch.' GI feels TV manufacturers in ten years time will not build complete receivers except in small quantities; that receivers will be sold less their RF tuning units, less their amplifiers and detector stages. In effect, GI believes the TV set of 2004 will be a 'monitor'; a display system (many suggest it will no longer be a long necked CRT) with sound attached.

The adoption of the MPEG-2 digital format as a world standard would seem to suggest that in 2004 TV set makers could still be building all digital, MPEG-2 based, receivers. But most satellite, cable and now most telephone people seem to be siding with GI. For although by 2004 (and long before in some quarters) almost everyone now agrees digital transmissions (whether by terrestrial transmitters, satellite, cable or telephone lines) will have replaced analogue, the configuration of the MPEG-2 signals as to bandwidth, operating frequency, and scrambling (pay per view) protocols will not be standardised.

Cable, satellite and terrestrial broadcasters now agree that with digital transmission the use of TV channels as we now know channels will disappear. Bandwidth, which now defines channels, will be set by the programme content. And the system operator, whether cable or satellite or terrestrial broadcaster, will 'dial up' the bandwidth he requires for each telecast in advance of each programme.

Scientific Atlanta, arguably the world's most advanced digital to analogue RF designer, believes like GI that receivers will be reduced to display systems. SA suggests that for the next two decades or more, the digital revolution will expand at such speeds that no consumer will put up with having his brand new 'does everything' TV receiver routinely outmoded at two-year intervals.

SA believes the cable/telephone company (or the satellite operator) will provide (for a fee) their own format 'converter' which will, by universal agreement, 'nest' into the 'pouch' which GI envisions for Joey. These boxes will be rented or leased to the user and it will be the programmer who takes the converter risk, not the consumer. SA also sees hardware suppliers such as themselves taking an equity position in programming companies as a means of ensuring proper controls on the deployment of 'converter boxes'.

At least one major Japanese firm agrees; as a manufacturer of analogue (VHS) tape decks, they are designing a all digital system built around CD discs which will mate with the stripped down television receiver of the future. They anticipate the video program rental store will be the distributor (rental agency) of the player, packaged with movies and other events on a nightly/weekly/monthly rental programme.

A major European TV receiver manufacturer sees a similar scenario developing. They are designing a display system, built around a wall hanging flat screen, which will operate (and sell) as a separate product from the receiver/converter units.

SA and GI, meanwhile, see their roles as cable TV converter designers becoming far more complex and important in the decade ahead. In the early stages they are fielding mass orders for digital to analogue converters of from 300,000 to 2,000,000 per order. There's a message here and it is that 'by 5PM today' may not be fast enough.

Transcribers, adapters that turn analogue satellite TV receivers into digital receivers, are likely to be end-of-94 time frame available. General Instruments/GI, creator of the Videocipher scrambling system used by many North American satellite services, had originally proposed a new module that would slide into the descrambler 'hole' in satellite TV (IRD ready) receivers. The new module was to be a combination analogue/digital decoder/transcriber. That concept has apparently now been scrapped in favour of a 'card' that does essentially the same thing, but it will not slide into the 'IRD bed' of existing receivers. Lacking an IRD-replacement module, as originally planned, those who want analogue plus digital receiver may be forced to purchase a new receiver with dual capabilities. There is one problem with the 'transcriber' concept; digital signals must be taken 'off' the line ahead of the satellite TV receiver's limiter stage. Assuming 'transcriber' products do appear, some receiver modifications for transcriber use will be required.

HDTV introduction as a part of analogue to digital transmission system conversion will go further than merely new transmitters. With digital offering 30 dB coverage advantage over same analogue power levels, world-wide TV transmitters installed for digital will be 'turning down power' to as little as 1% of the present analogue transmitters. At these reduced power levels, latest solid-state transmitter designs could employ silicon carbide transistors in lieu of expensive, maintenance hungry conventional high power tubes. TV3 consulting engineer Phil Johnston of JDA Associates insists TV3s existing network of 63 TV transmitters will readily convert to digital format and says he has assurance of transmitter providers to this premise. Unfortunately for TV3 (as well as TVNZ) evidence from UK and US suggests quite to the contrary and new transmitters are likely in the analogue to digital conversion. In USA, consortium of Westinghouse and national PBS (Public Broadcasting System) has petitioned US government seeking release of technology originally created for US military radar systems employing silicon carbide transistor designs.

PERSPECTIVE: Most Popular (US) Brands, Repair Records.

Consumer Reports, (US) national magazine highly regarded for decades of reporting on consumer preferences and testing of products, in this month's issue relates findings in survey of 231,000 US readers.

US consumers rated following as best brand units requiring fewest repairs:

- 1) Compact camcorders - Sony and Canon brands
- 2) VHS camcorders - Quasar and Panasonic
- 3) 13"/330mm (or smaller) TVs - JVC, Hitachi
- 4) 19-20"/482-508mm TVs - JVC and Panasonic
- 5) 25-27"/635-686mm TVs - JVC and Panasonic
- 6) VCRs - Magnavox, Sylvania
- 7) Single play CD players - JVC, Panasonic, Kenwood, Technics
- 8) CD changer/players - Sony, Technics

Repair costs. Readers surveyed provided reports of recent repair costs (without regard to fault and when averaged across 35,000 respondents it pretty well washes out specific faults) as follows (averaged):

- 1) 13"/330mm TVs - NZ\$142
- 2) 19-20"/482-508mm TVs - NZ\$146
- 3) 25-27"/635-686mm TVs - NZ\$182
- 4) VCRs - NZ\$180
- 5) Camcorders - NZ\$182

Readers listed major problems with repairs and in tabulated results complaints were: (#1) Took too long (more than 2 weeks), (#2) Was not repaired correctly, (#3) Cost too much, (#4) Didn't work well after repairs.

Video Magazine, US video enthusiasts publication, has announced their own reader rated 'best of class' products for 1993 year. And (the envelopes please) they are:

VCRs - JVC S-VHS HR-S6900

Direct View TVs - ProScan 27"/686mm model PS27152

VHS Camcorder - Panasonic SVHS AG-455

8mm Camcorder - Sharp VL-HL100U Hi8 Viewcam

Projection TVs - Panasonic 50"/1270mm model PT-50WXFT

Model numbers are NTSC but an inquisitive mind could quickly determine New Zealand available equivalents.

HDTV standard details: System will perform with either 1080 line interlaced scanning or 720 line progressive scanning. Interlaced scanning is preferred for broadcast TV while progressive scanning is choice of computer users. The Dolby AC-3 sound format has six channels of sound for left, right and 'surround.'

Swedish national telecaster SVT is planning a nation-wide interactive television network which will require television receivers making use of the system to have at least 100 Mbytes of information storage. Called Idun, the digital system will function with terrestrial TV, cable or satellite transmission and either standard 625 or HDTV line rates. Modelled after the popular Windows programme, the system will allow users to call up virtually any text or video source, including both still and moving video, on demand with a hand held remote unit using a 'return' command channel. Sweden is the first to formally plan a national digital interactive data system.

Germany's Deutsche Bundespost Telekom has joined technology forces with Astra satellite family operator Societe Europeenne des Satellites to refine format for delivery of digital video via satellite (and cable). Several Astra transponder users have promised digital video to home satellite terminals early in 1995 and Astra would like to see a pre-emptive standardisation of transmission standard, to facilitate generic digital video home satellite receivers, before that happens.

Japanese officials have announced digital video protocols for use in satellite, cable, and terrestrial transmission systems. Ministry of Posts and Telecommunications says users will use Integrated Service Data Broadcasting format, in terrestrial services employ Orthogonal Frequency Division Multiple Modulation techniques. MPT promises that present allocation of transmission 'channels', in use for analogue transmissions, will be revised after review due to be completed in March. With new plan, TV broadcasters will be assigned new terrestrial frequencies for parallel digital telecasting to allow consumer receivers to begin transition from analogue to digital in Japan.

C Cube data compression/decompression chips (CLM4500 and CLM4600 respectively) begin volume delivery to satellite and cable hardware building clients within the next sixty days. The C Cube devices allow the first 'real time' compression of digital signals without tying up valuable and complicated computer equipment which previously was required. C Cube, a Milpitas (California) firm is co-owned by a number of US and Japanese firms who in 1988 saw the coming need for specialised chips to handle digital video processing. CLM4500 operates at a speed of 60 million decisions per second analysing individual picture frames and eliminating all redundant information previously transmitted (CTD: 9308: p.2). C Cube suggests that a modern cable system offering 80 channels of TV presently would spend around NZ\$45,000 to install the compression equipment thereby creating space for 4 x 80 or 320 'total' TV channels. In the home, a converter/processor equipped with their companion CLM 4600 sorts out the compressed and redundant data instructions, recreating the picture as if it had been totally transmitted in real time.

Zenith intends to push its own adaptation of MPEG (compressed digital video) within the cable television industry (CTD: 9312, page 26) and has teamed with major device supplier LSI Logic for manufacture of specialised 'chips.' Zenith used Montreal cable system to demonstrate higher speed 43 Mbps data flow in (US) standard 6 MHz TV channel space. With 1.5 Mbps per movie service Zenith says more than 1,000 separate programme services can occupy same cable service at same time.

Thomson developed MPEG-2 direct broadcast satellite (DBS) digital receiver will be first consumer use of new technology. Thomson admits there have been some last minute problems with pushing MPEG-2 based receiver package into mass production, tied largely to slightly tardy delivery of first generation MPEG-2 chip sets. DBS satellite with 18"/460mm home dishes at NZ\$1200 go on sale in US in April and will offer 70+ channels of television initially.

Philips, Japan's Alps and Matsushita are asking other TV tuner manufacturers to join them in creating standardised 'dimensions and interfacing protocols' for TV tuners in new generation digital TV receivers and VCRs. The three manufacturers believe if all tuners were physically and electrically interchangeable, on world-wide basis, a major impediment to creating true world standard digital TV receiving systems would be overcome. Proposal reportedly originated at Philips.

CONSUMER ELECTRONICS

Projection television systems appear to be heading for next plateau of technology with quantum leap in picture quality, brightness, and acceptable viewing angles within next 18 months at consumer level. Early production sets using several new projection techniques have drawn seriously favourable reviews with an industry feeling that pricing will come down soon as new quality pictures appear in marketplace. Taiwanese CMC Magnetics Corp. using MGM Home Theater brand name is early runner with process it calls 'depixelization.' Grainy appearance of all projection systems to date have given images artificial blotchy appearance. Depixelization blurs pixel (individual

picture element) 'edges' creating improved smooth flowing image. The technology came out of US\$1M grant from Pentagon Defense Advanced Research Projects Agency. CMC Magnetics has goal of small, lightweight TV tuner/projector package only slightly larger than New Zealand consumer used SKY TV decoder box with NZ\$1,800 price tag; a significant break through if realised.

Sanyo and Motorola have joined corporate forces for a breakthrough technology project involving LCD TV/computer screen display systems. New LCD technology does away with expensive active matrix format of LCDs in favour of 'passive displays' wherein the electronics normally included within the display proper is moved outside as a separate segment. Active matrix LCDs have suffered from high quality control rejection rate and complex production techniques. New system moves LCD addressing function to outside-of-LCD display, greatly increases LCD 'yield' in production and results, developers claim, in CRT-like display clarity at fraction of price. Firms expect this to move LCDs into bigger screen area by end of 1994 providing competition to CRTs up to 20"/533mm in size but without physical shape and size limitations of CRTs.

Cathode ray (TV/computer display tube) radiation was once feared to be possible cause of various cancers; you may recall 'CRT Radiation Scare' a few years back. Now Korean manufacturer Samsung claims to have 'harnessed' the picture tube's radiation and further claims to have converted it to a beneficial rather than harmful form. Samsung says they have developed a 'Bio Television' format that emits radiation in the so-called 'near infrared' wavelengths and they also report that when freshly cut flowers are placed in radiation field of TV set they somehow stay 'fresh' 50% longer than the same flowers on display out of the TV set's radiation field. They are serious about this; enough so that NZ\$5.6M was spent on project resulting in 14 patents being filed. Tests conducted by the Seoul National University also reported onion seeding sets placed within the Bio TV's radiation field grew to maturity at twice the normal speed. In the US, the University of California and U. of Colorado have agreed to conduct their own tests of the Bio TV phenomena. Samsung will export 25 and 29" Bio TV models this year but will not be able to make 'medical benefit' claims in the US (nor possibly initially sell such TVs there) pending a detailed study by the (US) Food and Drug Agency (FDA).

TV set in the bathtub? Would you call it a bathtub? Sony has created, under contract, a 4" LCD TV receiver which is designed for operation in 'very moist environment' and the seller, a Japanese plumbing supply line called Toto, says it will survive the 'occasional dunking' in the bathtub. Price will be NZ\$900.

Don't try this in your home. New Thomson (RCA brand) product allows you to plug your telephone into any electrical outlet in home with electrical outlet doubling as carrier for telephone service. Called Intelejack, master control unit (NZ\$180) plugs into AC outlet and interconnects with cable to phone line jack. This places telephone circuit onto house wiring. At any AC wall outlet where you wish to have telephone, companion 'extender' at NZ\$89 plugs in and phone plugs into it. Additional phones can be added as desired with additional extender units.

UK top selling TV brands are Sony, Toshiba and Ferguson. Point spread between top sellers is small in TVs as well as VCRs where 1st place JVC has 6.8% of market while 5th place Ferguson has 5.9% of share.

French government has sold off Grundig production facility to private Wales based British firm Gooding Consumer Electronics (GCE). New firm will manufacture TV sets, satellite TV receivers at (French) Creutzwald plant under Continental Edison and Minerva brand names projecting 500,000 TV receivers in 13, 20 and 21" (US measurement format) sizes during 1994.

Philips found 16:9 widescreen TV sales disappointing in 1993; had hoped to sell 10,000. Initial set, 34W (for 34 inch widescreen) model, sold fewer than 500 in USA. Designed to differentiate automatically between 4:3 and 16:9 transmissions plus providing interlace and progressive scanning modes as well as expand and zoom modes, and POP (picture outside of picture for second channel monitoring), the NZ\$11,100 price tag was apparently beyond the market. Philips is not giving up; will transfer 16:9 marketing emphasis in current year to industrial fields where they feel widescreen video is making first inroads.

Thomson has responded by dropping price on 34W 16:9 widescreen receiver product line, and will show new models. Firm reports it did not hit its sales target of 10,000 16:9 sets they hoped to achieve, but feel the marketplace will be more interested in 16:9 product this year. Basic 34W model now carries list price of NZ\$7300.

Toshiba believes 1994 is the year for significant sales in widescreen TV arena and will begin shipment of 56"/1422mm rear projection model carrying TheaterWide TV model name in April. Previously, Toshiba's widescreen position was that too little letter boxed programming was available to create demand for sets. Toshiba says new product release has been prompted by April launch of DBS service for US with a number of the all-digital channels carrying letter box format movies, by gradual growth of laserdisc movies (700 titles are now widescreen format), and by expanded use of widescreen transmission by cable services such as TNT. The Toshiba model has

NZ\$9100 suggested retail price and will be sold with bonus laserdisc player and/or laserdisc movies in widescreen format.

Atari's Jaguar interactive game system missed 50,000 shipment goal by wide margin at year's end. Atari planned 50,000 units into retail channels by Christmas market, was only able to manage 20,000 units citing 'start-up production and supply problems' for shortfall. US retailers report heavy consumer interest beyond modest supplies available. Firm also found technical problem with cable that interconnects game to TV set; it was radiating interference into other receiving equipment.

JVC will sell US version of combination Sega and Genesis package for NZ\$900 retail list. Calling product 'X EYE' (for exciting visual), unit is being promoted as unified entertainment system rather than pure game console. Unit will handle CD + G discs, standard audio discs and with adapter plugging into Genesis ROM cartridge, electronic book format discs. It will not play video CD. Sega had offered Wondermega package in Japan at NZ\$1275 through toy outlets, found market 'soft' at that price and through those outlets. JVC sees package as a family entertainment/educational tool more than simple game console and will market it in new form accordingly.

NAFTA (North American Free Trade Agreement) adds complicated twist to long term planning for critical component parts used in assembly of consumer television receivers. Mexico, largest foreign supplier of TV receivers to US, benefits with elimination of 5% duty (already in effect). But, NAFTA fine print singles out TVs using picture tubes over 13" (330mm) imported into Mexico from outside of NAFTA region and subjects them to 5% duty all over again plus picture tube itself is tagged with 15% Mexican import duty. Bottom line? Mexican assembled TVs using non-NAFTA picture tubes will end up being 11 to 15% more expensive in US/Canadian stores than before NAFTA. Thomson RCA operates only Mexican picture tube plant with annual capacity of 500,000 tubes. US tube producers have 15M-plus annual ability but during 1993 up to 3M picture tubes of Asian manufacture entered Mexico bound for USA in Mexican assembled receivers. In a strange twist, TV sets manufactured outside of NAFTA attract 5% duty when shipped to USA regardless of picture tube origin. If TV sets assembled in Mexico using Asian picture tubes attract 5% US duty plus 15% Mexican duty on Asian content, manufacturers would actually save duty by building entire receiver in Asia and shipping directly to US. A world shortage of picture tubes, especially in 25" (635mm) and up region, further complicates task of forecasting likely pricing during 1994. Perhaps anticipating these problems, Nippon Electric (Glass) has purchased remaining 50% interest in Owens-Illinois picture tube plant and announced 8% increase in 'glass prices' for 1994.

US television receiver marketplace went through unexpected adjustment during 1993. Average screen size in US marketplace is now in region of 25"/635mm with more than 30% of all receivers 27"/686mm or larger. With growing trend to larger screen sizes, more and more of the receivers now purchased are originating at US plants. Major Japanese firms have been building assembly plants for US receivers in America over past five years. During first three quarters of 1993, more than 52% of all colour TVs sold in US were manufactured there; a sharp increase from prior years.

Litigants in growing number of patent suits involving multimedia 'search' routines do not anticipate a quick resolution of their cases. Citing a *"lack of basic understanding of the art"* on the part of the US Patent and Trademark Office, litigants are concerned that 'prior art' in software routines has largely been ignored in the granting of patents to date. Compton NewsMedia has been granted a 'basic' patent for multimedia search system and has placed others such as Microsoft 'on notice' concerning their patent. Extensive (read expensive) court hearings are likely but first US Patent Office promises a relook at the Compton patent.

Digital CDs transmitted to your home via your telephone line and into computer (memory). Major lawsuits underway in US where CompuServe bulletin board known as 'MIDI/Music Forum' now allows subscribers to ask for specific music cuts or full CDs which are then transmitted to user via modem/computer for recording on user's hard disc. Phone line delivered digital format music is then played back through computer drive to sound system in home. Music rights owners are understandably outraged that copyrighted music is being 'transferred' without payment to originators. Class action suit brought against CompuServe is first of its kind. In question: whether MIDI/Music Forum violates copyrights by distributing digitised CD data to CompuServe subscribers. Users of bulletin board pay fee for each service 'call' but this apparently does not include 'reserve' for royalties to music originators. A competitive system, called OmniBox, plans similar service but has completed royalty payment agreements with major music rights owner groups to insure payments are made for each such 'transfer.'

CBC (Canadian Broadcasting Corporation) has begun distributing recycled radio programmes via Internet computer service. System uses 8-bit technology to create 8-kilohertz audio bandwidth and programmes are available (for a small fee) via Internet on an instant-access basis.

Pirated Nintendo games by firm calling itself CCC Entertainment has brought US\$228,000 judgement against firm in New York court case. Firm was found guilty of distributing more than 1,500 separate copyrighted Nintendo Entertainment System games as well as marketing device called 'UFO Super Drive' that allowed user to copy 16-bit Nintendo games onto computer disc.

CD singles pressed during 1988 with Polygram or A & M labels may be deteriorating in boxes. Apparent cause, which discolours in process, was high sulphur content in paper sleeve that protected CD when shipped and sold. Most of the singles affected are now classified as 'collector items' because of artists and period involved and Philips PDO plant in UK was apparent source for time-defective CDs. Some of these self destructing CDs will appear in New Zealand collections.

PERSPECTIVE: *Cable TVs Rush To Information Networks*

To coin a **Bill Clintonism**, *"It's the bandwidth, stupid."*

During the last sixty days several dozen significant US cable companies have teamed with a similar number of software based information providers to test broadband cable's interactive ability to directly interface cable customers with data networks. Cable industry leaders are suggesting that by year end, millions of US homes will have the option of plugging into data services at information transfer speeds up to ten times 'faster' than the best transfer speeds available from the local copper-wire based telephone company.

Speed, in the computer world nothing drives sales of equipment or services more than speed. Each new generation of computer replaces predecessors by working faster. Present technology 486 chip-based computers manipulate data, solve problems, create displays at speeds five to ten times faster than their immediate ancestors. As computers work internally to solve problems and run programmes faster, the need for computers to communicate faster between one another also increases.

Picture a 300 km/h race track bred car. Imagine it slowing down in a posted hospital driveway to 10 km/h. Only a fraction of the car's ability is being used. If every street on which this car was driven had 10km/h speed limits, the car's faster abilities would be quite useless.

When two computer based units 'communicate', the speed of data transfer is everything. Faster speed requires greater bandwidth; just as a high definition television picture requires greater bandwidth than our present 625 line picture system.

Copper-wire built telephone systems are only as 'fast' as the bandwidth of the most constrictive part of the system. Two computers, one in Wellington, one in Auckland, interconnected via a wide bandwidth fibre optic cable can communicate at speeds limited only by the computers. Why? Because the bandwidth of the fibre optic interconnection is greater than the bandwidth (speed) of the computers.

Now replace a small segment of the interconnection between Wellington and Auckland with old fashioned POTS (Plain Old Telephone System; see **CTD:9309, pages 2-13**). A kilometre or two of twisted pair copper wire inserted into the system between Auckland and Wellington, with a maximum speed of 9600 bps (bits per second), forces the entire system to 'slow down.' It is just like pulling off the raceway track in your 300 km/h capable race car into the hospital driveway.

Prodigy, until now limited to 9600 bps data exchange with on-line customer computers, will be testing 500,000 bps (500 kbps) to move data. Northern Telecom will be installing 10,000,000 bps (10 Mbps) switches in cable systems this year; 40 Mbps in 1996, 80 Mbps by 2000; if not sooner. General Instruments (GI) and Intel are conducting 'high speed tests' for access of on-line services. America On Line, CompuServe and nearly a dozen more on-liners are participating. Building high speed modem and switching hardware are Digital Equipment Corporation, DSC Communications, EMI Communications, ComStream, AT&T and Hitachi. To name but a few. Cable firms will install consumer digital cable converters/modems in homes from San Diego to Maine and some of the announced 'tests' are anything but token; Omaha (Nebraska) will equip 100,000 cable homes for its 'test.'

Speed equals bandwidth and the US cable systems because of their new fibre optic grids have bandwidth to spare. And for the moment US telephone companies are 'speeding' to catch up. This is the technology New Zealand Telecom is preparing to 'test' in two Auckland suburbs and the technology that Kiwi Cable says it will install along the Kapiti coastline this year. *"And it's all about bandwidth, stupid!"*

STATISTICS/ QUICK UPDATE to November 30, 1993

Colour TVs, camcorders and audio CD players advanced in price at the import dock during November while black and white TVs and VCRs fell. With a single reporting month (December) remaining, the year to date (YTD) shipments point at a huge year for VCRs, a so-so year for new colour TVs, and a depressed year for camcorders, audio CD players and black and white TVs. A detailed summary of electronic imports and points of origin in **CTD 9402** (February 25). In November: black and white TVs amount to 58.3% of the total 1992 imports with a November value of \$297.53 each (YTD \$315.96); colour TVs 90.1% of 1992 imports, average November value of \$507.77 (YTD \$487.37); camcorders amount to 66.9% of 1992 imports with a November value of \$1,345.08 (YTD \$1,241.64); VCRs by the end of November totalled 105.5% of all the 1992 shipments with an average November declared value of \$466.26 (YTD \$476.68); and, audio CD players through November totals were 59.2% of 1992 imports with an average November value of \$275.85 (YTD \$259.19).

DCC audio system handwriting may already be on wall. Philips developed and backed system, presently fighting losing battle with Sony MD (MiniDisc), is being reborn as two format package for 1994. Philips will be selling new combination units which marry new DCC technology to old fashioned audio cassette technology. Player/recorders will accept either format which means users will retain established cassette features even if DCC format ultimately fails in marketplace. Matsushita is also working on a similar product but combining two into functional integrated package has presented major design obstacles. Analogue cassette portion uses separate erase head through which tape passes prior to the new writing head recording on tape. In DCC mode, tape is recorded in 'overwrite' format and the two are not directly compatible.

On screen programme grids, an electronic version of printed TV guides updated hourly when programmers change schedules, is believed to be a major growth area in TV programme use. First such systems using satellite transmission techniques began in US five years ago. New technology built around customised chips designed to extract programme 'grid' (listing) data from VBI (vertical blanking interval pulses) and display same on screen has become the latest competitive edge in US television receiver market. Zenith, largest remaining US based TV set maker, is pioneering field by arranging for distribution of TV programme listings via national PBS network of stations and via several of the major cable TV networks. Consumers with Zenith sets tune in any station carrying the programme data and in less than minute's time the full programme schedule for more than 100 TV programming schedules is captured via VBI and stored in temporary memory. StarSight system is licensed to Zenith and several home satellite receiver manufacturers and likely to become defacto standard for TV programme listings in US by end of this year. In present 100 channel universe, such a system is almost mandatory for viewers searching for specific programmes on full universe of channels available to them; with 500+ channel universe coming, system will be as important as the TV channels themselves. StarSight can be captured within TV proper, within satellite receiver where applicable, or by VCRs equipped with system. Goldstar, Mitsubishi and Samsung have signed licensing agreements for system in VCR field. StartSight system is not without competition; Gemstar system goes one better by allowing users with Gemstar equipped VCRs to dial up their VCR on telephone and using touch tone pads of phone instruct VCR to change channels and begin recording on selected channel at selected time. Latest product in this line allows up to 24 separate programmes on as many as 24 separate TV channels to be phone-instructed. In battle between market acceptance of Gemstar and StarSight, Gemstar has so far failed to arrange national (US) distribution of its VBI signal and as Hitachi exec noted *"If you don't have a broadcast partner, what good is a system when nobody can receive it?"*

Samsung plans US introduction of CD-I players by mid year. Philips/Magnavox presently have embryonic video CD market to themselves although numerous Japanese firms have announced their intention to enter field (**CTD:9311, p.28; 9312, p.27**). Samsung will offer player in NZ\$1100-1300 range with FMV (full motion video cartridge) built-in. Philips offers CD-I as basic package, sells FMV as optional extra since CD-I began as an interactive (games) format that has grown into video (movies) on CD discs more recently. Samsung is already shipping two models into Korean domestic market; one steps up by adding 12" laserdisc playback as well in single machine. Export version, with or without laser disc ability, is likely to feature five disc changer mechanism ala audio CD changers. Samsung forecasting 38% gross sales increase this year to US\$10B level.

Sony laserdisc player to be available in US by April does automatic switch from side one to side two in half time of existing models with price of NZ\$1155; more than \$300 less than earlier models. Sony has also announced February delivery in US of its first LCD display projection TV systems. System uses three separate LCDs but

production is limited to under 200 per month. Industrial version accepts any world standard analogue TV signal for display at NZ\$24,500 price; 'consumer version' is more modestly priced at NZ\$20,000 but only plays NTSC video.

Sanyo has begun Japan delivery of LCD projector capable of filling 100" screen with built-in VHS player; price is NZ\$6100 but may only initially be available in NTSC.

Sharp portable MD recorder is now on sale in Japan at NZ\$1300. Unit employs many unique features including allowing addition of text track which will read out on built-in LCD screen. In this way, user can group music cuts or sound sources and give each 'title' for scan and search purposes. Unit also has editing functions including erasure of previously recorded cuts, moving cuts around in sequence, and combining cuts.

Hitachi joins other major Japanese electronics firms by announcing 11% drop in consumer product sales coupled with 23% cut in net income for first six months of current fiscal year. Toshiba, going against tide of Japanese VCR makers who are shifting their production to lower cost Asian countries, is moving VCR mechanism production back to Japan. But final assembly of complete VCRs will stay in Singapore where Toshiba and Thomson recently opened jointly owned assembly plant. JVC, going with general Japanese trend, has announced it will increase VCR production at Malaysian plant co-owned with Philips this year and introduce VCR production to Chinese colour TV plant.

Philips is investing NZ\$606m in new colour TV tube plant in Taiwan where it already operates 4 plants. New facility will build 15"/381mm and 17"/432mm tubes with annual production target of 4,000,000 by 1997. Neither tube size is presently widely used in TV receiver production.

Sanyo will satisfy Japanese market for 25"/635mm TV sets by importing from Arkansas (US) plant. Sanyo expects shipments to number close to 100,000 during 1994, and is discontinuing all TV set production in Japan except for very large screen high end receivers. Japanese analysis of decision comes to conclusion Sanyo's American built sets cost less to produce than in Japan, even after allowing for shipping costs to Japan. Japanese electronics industry projects Japan as a nation will import more TV sets than it exports this year; first time ever.

Matsushita which has been pushing new 'Gaoo' technology line receivers in New Zealand reported 500,000 of the product line shipped in 1993; targets 1,000,000 for 1994. Firm's research places world-wide TV set market at 87.5 million in 1993 and its share was 8%.

Japan's consumer electronics output, the sum of all products manufactured and sold by all companies, declined in 1993 by 12.7% from 1992 level. Forecasts for 1994 see an additional 3.3% slow down in production/sales. VCRs led the decline in consumer electronics by falling 20.1% in yen value, 11.6% in unit volume. Colour TV set volume fell 10.2% in 1993 and is forecast to fall 1.9% again in 1994. EIAJ (Electronics Industries Association Japan) figures note two bright spots within Japanese consumer electronics industry are computer memory chips and LCDs which continued growth in 1993.

TDK financials for first half of current fiscal year reflected net sales down 12.2%, net profits down 46.2%. The firm blamed low cost audio and video blank tape imports now allowed to enter Japan for most of its declines. TDK is now combining production of video plus audio cassettes into single plant at Oita where previously only videotapes were manufactured. TDK plans to move more of its production outside of Japan by year end to take advantage of lower labour costs.

World statistics on audio and video tapes sold in 1993 point to stagnating industry. Audio C-60 tape equivalents actually dropped 1% in world-wide sales in 1993 from 1992 while VHS tapes went up 3%. Faster growing 8mm and VHS-C tapes were ahead 14%. Industry projects overall growth of less than 1% this year. How big are the markets? Audio Tape: 1.871B in 1993; Camcorder (8mm and VHS-C): 150M; and VHS (T-120 equivalents) at 1.078B.

JVC is not going to give in to onslaught of digital video without a last push for analogue. Their W-VHS system, latest in succession of analogue recording/playback advances that began with VHS and grew into S-VHS, employs 14.4 micron metal particle tape and claims video signal to noise ratios greater than 50 dB. VCRs, to be available next month at rate of 2,000 per month, have NZ\$10,200 price tag. Three separate recording modes are included with High Definition as top format, standard VHS and interesting dual-programme VHS with which two separate programmes (or video sources) are simultaneously laid down on special format tape side by side. Blank tapes are NZ\$81 (T120) and NZ\$97 (T180).

Sony denies having reduced pricing in FX model series camcorder suggested retail pricing with companion cuts in dealer costs but US dealers say there have been pricing changes. US cuts from \$50 to \$100 affect CCD-FX420, 520 and 620 camcorders. They hope to spur lagging sales with price cuts.

Panasonic has designed 1994 camcorder marketing programme around use of word 'intelligent' with 'IQ' series of point and shoot models extending from palm to full size camcorders. Five new VHS-C models have been introduced

with full feature automatic units carrying suggested retail price of NZ\$1455 to \$2000. Colour viewfinder appears in NZ\$1818 model.

Franklin Electronic Publishers begins shipment in March of voice synthesised all electronic bilingual dictionary. User selects from 250,000 word data base and machine speaks word in English, then Spanish (or in reverse) with NZ\$235 retail price. French/English, German/English versions will be available later this year.

Radio and TV broadcasters will gather in Los Angeles at Convention Centre this October 13-15 for joint technical show and exhibit that will draw 350 equipment exhibitors using some 120,000 square feet of exhibit space. Show is jointly sponsored by four groups including radio portion of National Association of Broadcasters, SMPTE and SBE.

CABLE/FIBRE OPTIC TELEVISION

Cable television for terrain/distance disadvantaged areas in New Zealand getting fresh look for large and small entrepreneurs. Broadcast Communications Limited (BCL), technical arm of TVNZ, has appeared before district council for Whitby section of Wellington seeking Resource Management Act (RMA) approval for construction and installation of cable television receiving tower and coaxial cable network there. BCL believes that where existing VHF/UHF transmitters and translators cannot reach population pockets, it sees a 'business opportunity' to provide cable-relay of free-to-air television signals to homes via 'pocket-sized' cable systems. BCL will use 550 MHz bandwidth technology as a minimum with Jerrold Electronics plant equipment, Phasecom (Israel) headend signal processors. BCL quickly ruled out use of most headend equipment because it is not PAL-B/G designed with NICAM stereo capabilities. BCL had originally planned three 'pocket-sized-cable systems' as trial of traditional coaxial cable TV technology, revised plans to single larger system. BCL installs and maintains TV1 and 2 national network of TV transmitters and translators; does similar work for TV3, SKY and others. This will be their first foray into private ownership of cable television systems; they have Network Operator status from Ministry of Commerce which grants them broad approval for such systems. (NOTE: Our sister publication **Tech Bulletin** for December/January describes the procedures for starting a cable system in detail. \$30 for TB/CABLE from R.B. Cooper, P.O. Box 330, Mangonui, Far North.)

Telecom's oft-quoted spokesperson Jeff Carter has been attributed with statement that telephone company "*no longer views Pakuranga and New Lynn trials of fibre optic cable as a test*" indicating to those present Telecom sees "*little alternative but to proceed with some form of fibre optic rollout for at least the metropolitan areas of New Zealand.*" There had been speculation the costs associated with the burial of fibre optic plus coaxial cables in Pakuranga and New Lynn had been 'an eye opener' to Telecom management; so expensive that by extrapolation such costs expanded to all of Auckland, for example, would be prohibitive. Current thinking of Telecom is that even at costs of up to \$100-200 per metre for buried distribution plant the potential returns for the high bandwidth technology outweigh the going in expenses.

Telecom fibre optic test in Auckland suburbs has added Worldnet satellite transmissions to channel line-up. Service is 'free to air' for New Zealand cable systems after minor amount of haggling with American embassy here; Kiwi Cable (Paraparumu) pioneered use of Worldnet plus still Auckland-missing French RFO services nearly two years ago.

Kiwi Cable Ltd. 330 MHz bandwidth traditional coaxial cable system serving Paraparumu north of Wellington is being expanded and rebuilt simultaneously. Present 330 MHz amplifiers will be replaced with 550 MHz amplifiers, adding equivalent of 31 PAL-B analogue channels. A new shipment of equipment is also enlarging the system to include approximately 500 new potential subscriber homes. At the same time, Kiwi Cable is completing engineering planning to allow overlashing of all existing plant with fibre optic cable and they will co-install fibre and traditional coax on poles plus underground as system expands. System's unique Movies On Demand service that allows subscribers to use telephone to order customised movie 'rental' transmitted to their home is said to be 'flat out' at peak times (weekend evenings) with many potential orders now being turned down for a lack of bandwidth. This demand-exceeds-bandwidth situation is forcing Kiwi Cable to upgrade its plant capacity and to begin the conversion to far greater fibre optic bandwidths. Average cable home now renting between 5 and 6 movies per month which effectively doubles system's gross revenues from basic cable service.

Kiwi Cable, still denied access to American ESPN network programming, is asking for ruling from New Zealand Copyright Tribunal. ESPN provides bulk of sport programming for SKY Network through agreement that includes word 'exclusivity.' New Zealand copyright law is widely interpreted to mean that such exclusive agreements can only apply where SKY is available and that ESPN could not, for example, deny access to its programming in Kaitia or

Greymouth where SKY does not reach. It is on this basis that SKY makes available little publicised 'ESPN-Direct' service whereby individual homes, motels, bars and others located outside of SKY service regions may install their own satellite dish and receive ESPN satellite direct scrambled transmissions using SKY as middleman for descrambler and programme authorisation. Kiwi Cable protested SKY expansion into Paraparaumu region (moving this relatively lightly populated area ahead of larger communities such as Hawkes Bay and Dunedin et al) when Kiwi Cable announced operations, charging SKY did so solely to protect its 'exclusivity' arrangement with ESPN. SKY availability in Paraparaumu region effectively prevents Kiwi Cable from having an ESPN distribution agreement. Kiwi Cable is asking Copyright Tribunal to refocus on existing copyright law charging the law never intended for a firm such as Kiwi Cable to be denied access to either ESPN direct or alternately SKY itself. Kiwi Cable believes that as long as it is denied access to the only available satellite sports network, growth for cable will be limited. A favourable ruling from the Copyright Tribunal could be first step to achieving closer parity to SKY.

PacSat cable system for Greymouth backed by John Rutherford of Christchurch failed to make Christmas holiday's planned start date. Firm continues to install 1/2" aluminium jacketed cable within city blocks but to mid January had not negotiated a contract to rent pole space from power utility. Actual cable, a type normally suspended from utility poles rather than buried, is being tacked to fences, houses in non-standard manner inside of black alkathene pipe. Two 'test channels' were reported to be available to selected homes in mid-January and the firm had not sorted out problems relating to automated tracking of its satellite dish on Intelsat 508 at 180 degrees nor figured out how to make TV3 available, as promised, to cable subscribers.

US cable statistics show industry growth continued in 1993 at healthy pace. 90.2% of all US homes now have cable service available 'at front door'; of these 88,451,000 homes, 64.7% (57,200,000) subscribe to 'basic' (lowest dollar cost per month) cable and 43.3% (38,310,000) of all US homes now also subscribe to optional 'pay TV' services. TCI/TeleCommunications, Inc., would-be corporate partner of New Zealand telephone investor Bell Atlantic, is world's largest with 17.9% (10,248,000) of US cable homes and 220,000 miles of cable plant installed.

Big bandwidth fibre optic competition between the larger cable network operators, and regional (US) telephone companies, will be in full swing by end of 1994. Washington (DC) suburb Alexandria, Virginia which is a bedroom community for many Washington politicians, their aides, and bureaucrats, will see cable operator Jones Spacelink Ltd. (9th largest US cable operator) teaming with Bell competitor MCI to offer 'cable telephony' utilising newly developed Scientific-Atlanta CoAccess hardware. Bell Atlantic plans to overbuild (i.e., place their own fibre optic cable system on top of) Jones in Alexandria and hopes to expand VDT (video dial tone) coverage to include 25 Washington (DC) exchanges, portions of nearby Maryland if FCC approval is gained. Bell Atlantic won right to enter fibre optic cable business in Virginia court ruling last August (CTD: 9311, page 30). Chicago is another market being eyed for wide area cable-telephony competition and in this case it would take on another New Zealand Telecom part owner, Ameritech, which operates Chicago area telephone network. Elsewhere in USA increasingly cable firms are teaming with data system networkers to 'test' cable as delivery system. 'Speed' or bandwidth is the reason. In Exeter, New Hampshire Compuserve network will use Continental Cablevision (3rd largest US cable operator) system to test direct Compuserve to home interconnection while in San Diego Prodigy network is teaming with Cox Cable (6th largest US operator) to test 'Enhanced Prodigy' service package that will, because of greater bandwidth/speed available, allow full transfer of video images and photographs in near real time. Compuserve/Continental claim their interconnect will allow transfer speeds approaching 500,000 baud; approximately 50 times faster than current 9600 baud telecom network limited transfer rates.

Moscow (USSR) where many westerners complain basic telephone service is lacking could leapfrog into fibre optic world by year's end. Moscow city government, private investors from Europe and American firm First Pacific Networks currently installing broadband cable plus telephone plant to serve initial 15,000 points in Moscow; will expand to 300,000 when core system is complete. Hardware is coming from US firm General Instrument and is being designed in British fibre/coaxial hybrid star network configuration.

US cable industry is beset with merger and acquisition scenarios, fuelled by pending merging of Bell Atlantic and cable giant TCI. December California trade show saw numerous such mergers underway including Bell Canada investment of NZ\$495M for 30% of Jones Intercable empire (this Canadian investment immediately drew fire from prominent US Congressman who asked that limits be placed on percentage of cable company ownership that can be held by non-US owners). Cable industry has since 1950s been driven by comparison of system sales/mergers on basis of 'price-per-subscriber', or, 'cash-flow-multiples.' Latest wave of deals usually fall in region of 6 to 12 times 'annual cash flow' with systems in larger communities commanding higher cash flow multiples. In recent sale announcement, major owner Cox Cable agreed to sell 21 of its systems to telco Southwestern Bell for US\$1.6B

which works out to NZ\$5,550 per cable subscribing home. Cable industry expects federal US rules limiting telco investments in cable to areas where telco does not operate (to avoid the telco controlling both cable and telephone) to 'go away' within 24 months. This would open cable operators in aggressive telco areas to head to head competition from telcos; many cable operators see this as 'window of opportunity' to join telcos, through mergers or acquisitions, rather than be subjected to telco competition by 1996.

Five major cable system US owners have joined forces in new 'super corporation' to allow them to jointly compete with existing telcos. TCI, Times Warner (both investors in SKY here), Continental, Comcast and Cox have formed super-corp called Teleport Communications Group. Between the five they serve 24,684,000 US homes or 43% of US cable home universe. More importantly, they serve 37.9% of all US homes that have 'addressing capability'; i.e., each home can already be singled out by computer addressing for specific services on demand. By merging their respective technical and financial abilities, group plans to go head to head with telephone for next generation addressable (by home) interactive (two-way) digital (compressed video) service lines. Chicago is considered a likely first effort, against Ameritech (which owns portion of New Zealand Telecom).

Japanese cable television is in format dissimilar to most of world. Called 'SMATV' (for satellite master antenna television), typical systems use a few kilometres of coaxial cable from master satellite and terrestrial antennas to homes in one multiple-dwelling building or within city block. Typical system has fewer than 500 subscribers but there are more than 30,000 such systems. Japan now proposes to modify national rules which prohibit CATV/SMATV systems from being more than 20% foreign owned. New rules would allow 100% non-Japanese ownership under certain circumstances. Because of small size of Japanese SMATV systems, Japan has never developed technical expertise for products required by larger city wide systems using hundreds or thousands of kilometres of cable. Japan's new rules will allow interconnection of individual SMATV systems into larger true-CATV plants and that in turn will allow development of fibre optic combination systems with telco and multimedia signals.

GATT involvement in telecommunications arena turned out to be non-event. After years of haggling over farm and clothing subsidies, it came down to an end run over films and television programming. American interests fought hard but late to open up European cinema and video markets for their products, offering European's equal access to American markets. But this would have required substantial reduction in government subsidies to French (and other European) film and video makers. French industry saw the move coming, reacted last September to appearance on satellite of two Ted Turner programme services (cartoons, older movies) threatening to scuttle GATT if necessary should Turner's programmes continue. That set the stage for French protests to US initiatives within GATT framework. At a lower level, new GATT agreement does redefine terms of basic copyright with 20 year term now in place for appropriate international recognition of registered original rights. French claimed protections are required to keep French 'culture' from being diluted. American movie representative Jack Valenti countered "*Culture hell, this is all about the hard business of money.*" Some Europeans were willing to increase American film and video access to Europeans but only if US was willing to invest money into European created audio/video programming.

Cable's new promise of 500 'programme channels' into the home by end of this year is already past-tense; improved efficiency of compression techniques, spearheaded by Zenith and others, has already changed the rules to potential 1,000 channels per system with more just a compression development away. And now that the 'hype' is dying down, serious system planners are beginning to show concern for implementing their newly found technical capabilities. Leading the concern is the recognition that if 500 channels of programme selection is beyond the typical consumer to assimilate, 1,000 channels is in the Twilight Zone. Enter the computer industry with its much-needed ability to 'manage' and perhaps fill these channels with material which attracts consumer interest and dollars. The typical US cable home already spends upwards of NZ\$60 per month for cable services and averages just over 40 channels of reception. Programming 500 channels will naturally be more expensive to the cable operator than programming 40 channels. And virtually all of the new channels will be 'optional extras'; supported by viewers selecting them from an ala-carte 'menu' of services offered programme by programme or channel by channel for an additional fee. Some examples of new US cable service channels being readied for satellite distribution to next generation 500 channel systems: The Golf Channel, The Military Channel, FAD (Fashion and Design), The Book Channel, The Technology Channel, The Bridal Channel and the Idea Channel. More than 60 new cable service channels are scheduled for 'launch' by end of this year; another 55 by end of 1995 and average estimated launch-cost for each is in region of NZ\$82m. Silicon Graphic head James Clark is warning cable "*consumers don't and won't buy technology* (for the sake of being technically correct); *they buy products when they are priced right.*" Early

reports of consumer resistance to hundreds of available channels are filtering in from test systems such as Castro Valley (California where system's research director notes *"People are not clamouring for all of the new services available and they do not want to have a TV system that requires them to work at programme selection."*) Navigation tools, making programme availability easy to assimilate and selection painless (if not free) is the latest cable concern. Firms such as Silicon Graphics hope to create 'consumer navigation tools' (read software that allows consumer interfacing with the Twilight Zone) to make the next generation TV more acceptable to what some now worry will be an underwhelmed home TV user.

US legislation to more properly define the respective roles of cable and telephone service providers will be major part of the 1994 Congressional sessions. Clinton administration wants enabling act to allow creation of 'fibre optic data super highway' system and Congressional supporters are considering ways to ensure such a system provides universal, low-cost access to every level of American user. The major battle fields are likely to be in the so-called 'local-loops,' the metropolitan regions where high population densities make broadband interconnections especially attractive. Cable supporters want cable in a position to offer telephony or switched services in the local-loop; telephone supporters want legislative approval to provide wideband (read video) services in same regions. If both get what they want, cable and telephone will square off as true competitors for local-loop customers. Clinton administration is suggesting total elimination of separate rules for cable, television, satellites, telephone and utilities ... but only after 'adjustment period' of perhaps five years as the technology implementation catches up with today's laboratory curiosities. One interesting area of focus: Administration sees information 'users' becoming primary source as information 'providers' within decade and believes any system created must allow for expansion of 'network' ability to allow individual users to transmit vast amounts of material rather than acting as mere recipients.

Merging telephone and cable technologies has drawn US communications regulatory agency, FCC (Federal Communications Commission) into fray with new 'standards' to be met by consumer modem/interfacing boxes. For two decades, cable operators offering in excess of 12 TV channels have relied upon set-top 'converters' as tuner-expander to bring in non-broadcast-standard TV channels. For past ten years, set-top units have also included various descrambler format electronics allowing consumers to gain access to video and/or audio 'scrambled' channels for which an extra fee is paid. Now FCC sees need for universal converter/modem technical standards as solution to rapidly expanding technology that threatens to leave TV set makers, and ultimately consumers, behind. One year ago FCC mandated technical rules but with rapid development of compressed digital video technology in past 12 months, revised standards are being proposed before first set find their way into actual pieces of hardware. Latest suggestions for the boxes include ability to tune-in any TV channel cable located between 54 and 1,000 MHz and plug-in interfacing with soon to be available 'digital modules' that will do D to A conversion of inward bound digital video signals to present-day set compatible analogue format signal(s). First set-top 'convergers' (standard analogue frequency converters plus added digital to analogue (D to A) processors) are now being readied for shipment to US cable systems priced between NZ\$462 and \$555 with giant TCI scheduled to take 300,000 units this year. Pundits forecast price will eventually drop to NZ\$277 per converger and ultimately any home participating in 500 channel-plus revolution will require one at expense of cable operator.

Indian company called Asianet Group is building most ambitious Indian cable network to date. System, located in state of Kerala, will pass 500,000 homes and is considered forerunner of major cable expansion throughout India for balance of this decade. System will initially offer only 12 TV channels, including 8 received from satellite feeds.

China, perhaps in partial answer to 1993 satellite dish proliferation, has announced 'official policy' of encouraging cable television programme distribution. Shanghai is to build fibre optic system with potential of 5m subscribers while 30 other cities with potential for 500,000 or more subscribers have been earmarked for the technology expansion. China's government proclaimed in October 1993 private satellite dish ownership was no longer encouraged and adopted rules for licensing of existing dishes; this in response to policy that 'foreign satellite programmes' were 'undermining traditional Chinese culture.'

TERRESTRIAL BROADCASTING

TV3 relay at Hokitika went on air as promised around Christmas time with plenty of confusion as to its 'legal status.' Channel 11 transmitter, operating at 5 watt power level as of early January, is said to be capable of 25 watts. Reportedly, TV3 engineering consultant JDA Associates granted Hokitika's non-profit translator group permission to 'test' TV3 service using direct trans-Alps knife edge refraction path signal from Christchurch subject to several 'conditions.' These allegedly included Hokitika agreeing not to accept financial support from Greymouth would-be cable operator PacSat, agreement to 'skew' channel 11 transmission antenna(s) to reduce likelihood signal would

reach Greymouth, and keep power level 'down' to further complicate PacSat picking up service. PacSat's John Rutherford had at one point promised to 'donate' approximately \$8,000 to Hokitika effort with understanding his cable firm in Greymouth would then use channel 11 signal to feed TV3 into Greymouth cable system. TV3's former CEO Ken Clark, in speaking to **CTD** just prior to his release from network, was adamant about TV3 belief that cable firms do not have automatic rights to carry TV3 signals. Hokitika self-help group that has funded channel 11 translator raised \$50 per family in service area to pay for installation, and a local outlet has done a brisk business selling cut-to-channel (11) antenna systems for around \$90 to receive the TV3 service. TV3 reportedly asked Hokitika group to select a retransmission channel that would be 'adjacent in dial position to existing Greymouth area TV1 and 2 transmitters' as a further impediment to PacSat picking up the Hokitika signal some 37km to the north; a 'request' Hokitika was unable to satisfy. PacSat's under construction cable system had gained considerable publicity and interest in its cable service by promising TV3 service on the cable. In spite of best efforts by TV3 and Hokitika installers, at least one Greymouth TV technician does have a colour picture from channel 11 using self-built sizeable yagi antenna array and very low noise GaAs-FET signal pre-amplifier. However, to our closing date PacSat had apparently not been able to duplicate this feat with their own engineering staff. JDA Consultants filed Hokitika license application, on behalf of TV3, was due out of Radio Operations at any time.

'**K-I-W-I'** (pronounced 'kiwi') is a radio broadcaster allegedly in the Hawkes Bay region. It transmits on (short-wave) frequencies of 5.850 and 15.049 MHz and is heard well throughout the Pacific, even into North America. Unlike Radio New Zealand International, 'KIWI' does not hold a license from RFS/ROG and therefore has no authorisation from the Ministry of Commerce. It is a pirate radio station. Even without the formality of a license, 'KIWI' maintains a quite regular transmission schedule (often around 1300-1330 hours UTC; midnight here in New Zealand) and even provides listeners with a mailing address for letters and reception reports (P.O. Box 1437, Hastings); and, it answers reports from listeners either over the air or through the mails. Overseas radio publications (UK's Shortwave Magazine, USA's Monitoring Times, Popular Communications) are intrigued by how 'KIWI' stays on the air without a license and write about it quite often. In an era of selling off management rights to various frequencies, the Ministry of Commerce may have overlooked another money earner; selling off shortwave radio broadcasting frequencies!

UCB's Missing Channel. **CTD** for December (9312) in analysing VHF and UHF channel 'loading' (pages 37-39) noted United Christian Broadcasting holds 38 UHF licences (primarily channels 59-62) but none at Auckland. We obtained this in response to an Official Information Request filed with the Ministry of Commerce 06 September (1993). In actual fact, UCB holds a license for UHF channel 59 with an eirp of 59 dBW at Auckland's Waitarua common transmission site; a fact we uncovered by filing a separate Official Information Act request with the Registrar of Radio Frequencies. We trust the Ministry of Commerce will correct their own records.

Ministry of Commerce, 60 days after promising to release new rules regarding low powered unlicensed FM 'billboards' now operating in 100-101 MHz region, has not done so. Present rules allow 300 milliwatts (eirp) power, adequate to cover up to 3km to a car radio. Primary users have been tourism related firms seeking to provide information to tourists concerning a particular attraction or region (see **CTD** 9309: p.23, 9311: p.33, 9312:p.36). Australian regulations have different approach, allowing radiated powers to 10 watts without major hassles using region between 87 and 88 MHz (just below existing FM band but within tuning range of most FM receivers). One entrepreneur on Gold Coast has installed transmitters programmed 24 hours per day in Japanese. 'Japan 87.6 FM' targets the Japanese tourist visiting the Queensland coastline (more than 13,000 weekly) with satellite delivered news, music and features from Japan. An estimated 150 tourism related FM transmitters are now functional in Australia in the 87-88 MHz region.

Bays Television, a UHF independent operating on channel 33 from Nelson, has begun carrying tape delayed programming originating at Christchurch's Canterbury Television. While not formally a network at this stage, the Bays/Canterbury linking is the first regular use of programming by two or more of the new-breed UHF independents in New Zealand.

SKY Network expansion into the Hawkes Bay and Dunedin regions (**CTD**: 9311, p.35) delay is explained by SKY as management decision relating to source for new UHF transmitters. SKY's original supplier displayed a lack of interest in meeting lower bid for new transmitters submitted by a second supplier. SKY ultimately ordered units from new supplier after engineering evaluation showed no significant differences between the two, and, the lower cost bidder agreed to allow two year payment terms. This stretched payment schedule was especially important to SKY since it allows firm to match payments to anticipated revenues from Hawkes Bay and Dunedin over two year growth period rather than fronting up the entire transmitter costs before any subscribers are 'on line.' With revised

schedule, Hawkes Bay (Mt. Erin) site should now be functional by March; Dunedin dates not presently firm but will follow Mt. Erin completion. Still ahead, Manawatu, Invercargill, and Wanganui regional transmitters.

Violence in television programming, subject of intensive debate in US and cause of pending legislation to force programmers to adopt programme 'ratings' (similar to motion picture ratings), now moving into video games arena. Games with extensive violence (i.e., Sega's Night Trap and Acclaim's Mortal Kombat) attracted attention of US Congressmen and hearings ensued to debate merits of allowing industry to continue to produce materials with 'adult story lines' but freely available to small children. International toy store chain Toys 'R' Us responded to concerns by removing Night Trap from its 500 stores. Atari, Sega, Sony and 3DO formed ad hoc committee to inaugurate industry self-policing system but Nintendo initially stayed away with statement that legislation should include not only CD ROM packages but floppy discs and CD games played on computers as well. Nintendo spokesman told Congressional committee *"Action should include the entire entertainment software industry; there is violent and pornographic software available right now for IBM and Apple PCs that would shock this committee, and America."* One possible example for Americans is Canadian code which bans violent programming before 9PM, has strict rules relating to children's programming and even restricts showing of 'gratuitous violence' in news and sports programming. US broadcasters, caught between growing anti-violence sentiment and sudden Congressional interest in violent games as well, are worried; NBC exec noted after first hearings *"A corrosive atmosphere of censorship is being created."*

American National Public Radio, akin to BBC or New Zealand national service, is adopting a global vision for its future operations. NPR will become Public Radio International (PRI) in July, modify present programme content to reflect international sources, and arrange for world-wide programme distribution via satellite feeds. Like BBC World Service radio now available into New Zealand via satellite link, PRI will offer opportunity for Kiwi radio broadcasters to become terrestrial affiliates. PBS (television), American national Public Broadcasting System operated primarily from corporate endowments, grants and public subscription, is following a similar 'global distribution' concept. PBS believes they should approach TV programming more as 'publishers' than as TV programme producers, see each project and subject as an opportunity to create and recreate the same material in CD-ROM, radio series, printed books as well as standard TV programming. A trial package consisting of six hours of TV programming per day, recycled four times to fill 24 hour schedule, and distributed world-wide via satellite is in the planning stages.

UK annual license fees for ownership of a colour TV set goes up 1.8% to 84.5 pounds April 1st.

SKY NETWORK BOX SCORE

As of 18 January SKY Network was serving 125,553 'subscriber equivalents' with three channels of service; representing a home penetration rate of 19.5%. Inauguration of the fourth service channel, to utilise TAB transmitters during TAB non-programming hours, is scheduled to kick-off in June or July. Subscriber equivalents are calculated by taking the total monthly gross revenues from both home and commercial clients (motels, clubs pay more per month than homes) and dividing by the currently SKY monthly 'home' price.

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WIDE/BIG SCREEN TV IMAGES

The increased emphasis on larger screen television sets, the promise of increased picture definition (through high definition/HDTV technology) and the swing towards wide screen television displays can be confusing to people brought up on standard CRT displays with a 4:3 aspect ratio. Some background may be helpful to you as you deal with the multiplicity of new display formats on the way.

1) Aspect Ratio: From the first television images there has been a 'difference of opinion' as to the most desirable ratio of a display screen width to height. Original pictures were square; an aspect ratio of 1:1. As television evolved various other schemes were offered including early French transmissions with a 2:1 aspect ratio (the picture was twice as wide as it was high). The technology that preceded television displays, the movie theatre screen, was held out as a 'standard' for emulation but unfortunately that has been an evolving technology as well. And for television, once a 'standard' was designed and display screens went into mass production the image aspect ratio was essentially frozen. Wide screen movie images became the vogue after television had settled more or less universally on a 4:3 ratio.

It is also important to recognize that the length of a single picture 'line', and the number of lines (the height of the display) have a direct impact on the amount of information to be transmitted. Each line has a finite number of picture elements ('pixels') and each pixel represents information (data). Pixels are transmitted in real time (analogue) or in 'groups' (digital). When you make a screen line of pixels longer (such as an aspect ratio of 5 to 3 with 5 representing width of the display), you have more information (data) per line than before. To transmit more data requires more bandwidth (space in which information is transmitted) and therein is the primary reason why a major change to 'widescreen TV' has taken so long to accomplish; the entire television system (channel bandwidth) has to change (increase) to transmit the additional information required to make a wider picture. In the interest of being technically correct, you might also employ multiple modulation formats to transmit the additional wider-line data as well. Since that concept did not move forward, we'll end that discussion for now.

2) High Definition is an increase in the number of separate (top to bottom of the screen) lines per image transmitted. This is just the opposite of a wider picture, which does not require more lines per picture, simply *longer lines per picture*. Ideally, an image would have infinite lines; billions per image. Realistically, each line presents transmission and reception challenges and as with making the lines longer for wide-screen displays, adding more lines requires *more bandwidth* as well. If we double the number of picture lines (from PAL's present 576 actual 'active' lines; 625 includes some that are for control purposes and do not contain image data), we double the bandwidth. In terms of spectrum space, a PAL-625 line picture that requires 8 megahertz of bandwidth would require (nearly) 16 megahertz bandwidth if doubled to PAL-1250 lines.

If you decide to (a) make the picture wider, and, (b) make the picture contain more separate lines of information (thereby improving definition), you have *two* separate increases in bandwidth. When every increase in bandwidth causes a complete change in the way individual channels are located in the spectrum, you can quickly see that any desire to provide a wider picture, higher definition, *or both* at the same time is a 'back to the drawing boards' root-change in the entire television system. From broadcast cameras to home receivers, everything has to change. Various schemes to get around this change, to make it possible for viewers to have 'optionally' (i.e., their choice) a continuation of their present low-definition, 4:3 aspect ratio picture, or, by purchasing a new-standards TV set, higher definition plus wider screen have been offered over the past decade. None were universally adopted until the digital option appeared.

It is important to realize that you may have wide screen TV without high definition TV, or conversely the opposite (although that was never seriously considered). European TV broadcasters are at present in favour of a wide screen picture, but they are not universally in favour of high definition. American broadcasters want both, together.

HOW WIDE A SCREEN?

Reader **John Dagg** (39 College Street, Masterton 5901) points out the history of aspect ratios. We are indebted to him for what follows.

"(the motion picture industry's) 70mm (film size) *aspect ratio as presented on the (theatre) screen is 2.2:1. If the correct aspect ratio of 70mm films were to be shown on a TV wide screen with a 16:9, black bars would still appear at the top and bottom of the screen, albeit somewhat narrower bar(s) than would be seen on a (present day) 4:3 TV screen.*

"Similarly, Cinemascope and Panavision pictures shown a slightly thicker black bar top and bottom on a 16:9 ratio TV. Cinemascope and Panavision (interchangeable formats) are both 2.35 to 1 ratio and it is from such 35mm prints that the TV dubs are made. Hence it is extremely doubtful that an original 70mm film (print) would

ever be used to screen on TV. (In fact) 35mm Panavision copies were made of 70mm shows for release in the ordinary cinema. (In creating the original film) the 70mm 'safe action' area had to be protected so that a 2.35:1 print could be made without cropping any action or important information off the picture. It is from these 35mm copies that master tapes are made for use on TV or (for) dubbing to VHS tape.

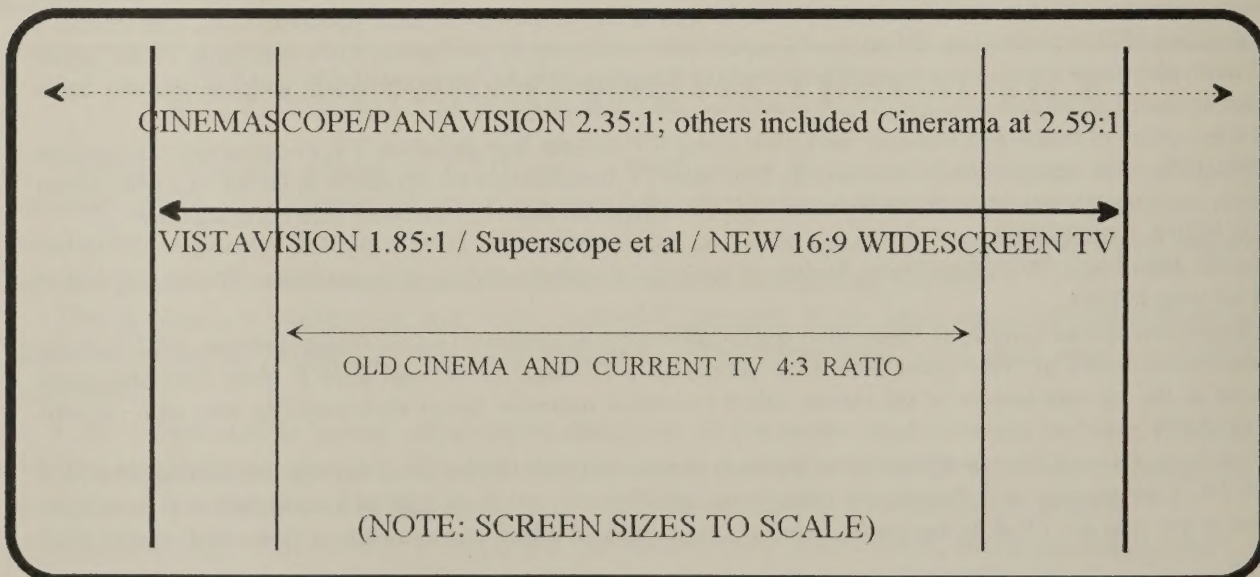
"(Only) the VistaVision format was a true 16:9 format, or very close to it. Thus the 16:9 aspect ratio format (which many now consider to become the new defacto standard for wide screen TV) is still a compromise (when compared to 70mm/2.2:1 or Cinemascope/Panavision at 2.35:1), and a not very good one at that. I have advocated that the TV industry transmit films in their original format regardless of the shape of the TV screen. I am pleased to see that more and more films are being shown that way including commercials made for both cinema and TV; i.e., the AMP commercials (which on a Philips 16:9 TV still displays black bars top and bottom)."

From this it is clear that while the 16:9 'wide screen' standard coming may be an improvement in display technology, it is probably not the final word in displays. Given that, the TV set manufacturers are grappling with how to help their dealers and the consumers understand the differences between 4:3 and 16:9 screen sizes. At the present time many (Japanese) set manufacturers have adopted the practice of tacking a 'W' on after the screen size to denote a 16:9 screen. A table here tries to sort that out and you may wish to copy this and pin where customers and sales people alike can do a quick comparison between 'standard' (4:3) and 'wide' (16:9) display formats.

Digitally compressed video offered the opportunity to add additional line-length-pixels and optionally more vertical lines per display screen in spectrum space conserved by the switch from analogue to digital format. This now makes it possible to have wide screen and high definition without increasing channel bandwidths. See CTD August 1993.

34W	in 16:9	19.13" high	34" wide	39.01" diagonal
32"	4:3	19.20" high	25.6" wide	32.00" diagonal
50W	in 16:9	28.13" high	50" wide	57.37" diagonal
48"	4:3	28.80 " high	38.40" wide	48.00" diagonal
58W	in 16:9	32.63" high	58" wide	66.55" diagonal
55"	4:3	33.00" high	44.00" wide	55.00" diagonal

SCREEN COMPARISON below (suggested by John Dagg) compares present 4:3 TV screen (lowest arrow) to new 16:9 widescreen (middle arrow) adapted from VistaVision/Superscope et al 1.85:1, and, representative super-wide movie formats Cinemascope/Panavision (top arrow) with 2.35:1 display. Others included ToddAO 2.2:1 (70mm) and Cinerama 2.59:1. Range of formats caused theatre operators no end of screen problems.



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